

**FINAL  
ENVIRONMENTAL ASSESSMENT OF THE  
U. S. ARMY ORDNANCE MISSILE AND  
MUNITIONS CENTER AND SCHOOL**

**Prepared for:**

**U.S. ARMY AVIATION AND MISSILE COMMAND**

**DIRECTORATE OF  
ENVIRONMENTAL MANAGEMENT AND PLANNING**

**REDSTONE ARSENAL, ALABAMA**

**Prepared by:**

**Vista Technologies Inc.  
5001 Technology Drive  
Huntsville, Alabama**

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**FINDING OF NO SIGNIFICANT IMPACT FOR  
ENVIRONMENTAL ASSESSMENT OF THE  
U. S. ARMY ORDNANCE MISSILE AND MUNITIONS  
CENTER AND SCHOOL**

**BACKGROUND:** The U. S. Army Ordnance Missile and Munitions Center and School (USAOMMCS) is an ordnance branch service school of the Training and Doctrine Command (TRADOC) and is a tenant of the U.S. Army Aviation and Missile Command (AMCOM) located on Redstone Arsenal.

Facilities and ranges used by OMMCS include the school Headquarters/campus and billeting area, two explosive ordnance disposal training ranges -- McKinley Range and Hazardous Devices Demolition Range, one explosive ordnance demolition range -- Corkern Range, two Field Training Exercise Sites, an inert training Ammunition Supply Point, a training Corps Support Area, a troop obstacle/confidence course, and a training HAWK Firing Battery Hardstand.

The current OMMCS mission is to train soldiers, marines, and International military students in combat service support military occupational specialties related to munitions management, explosive ordnance disposal, electronic maintenance of communications and missile systems (land combat and air defense missile systems), and test, measurement, and diagnostic equipment arenas. Also, basic and refresher training courses are provided to civilian law enforcement and public safety personnel on explosive ordnance disposal procedures. All training operations and activities have been established at locations that would have minimal effects on other Arsenal functions and adjacent communities.

**DESCRIPTION OF THE PROPOSED ACTION:** The proposed action is to continue the existing training operations mission using OMMCS buildings and ranges on Redstone Arsenal as they currently exist. Continuing mission activities at existing Redstone Arsenal locations would avoid the additional environmental, safety, and cost concerns associated with performing the OMMCS mission elsewhere. This action would also include the addition of a 2,200 square foot building and an underground training bunker/tornado shelter located on McKinley Range and the addition of a sanitary sewer system for the Ammunition Supply Point Range. The broad OMMCS operational mission would be maintained with new facilities added as required for modernization and replacement of existing facilities. Existing facilities would be renovated or repaired as economic analyses determine. This document would assist in tiering future environmental assessments where no, or only minor, mission changes occur.

**ALTERNATIVES CONSIDERED:**

Two additional alternatives to the proposed action were considered and eliminated from further consideration. One was the use of other facilities on Redstone Arsenal to carry out the current OMMCS mission. The other was to relocate OMMCS mission activities to another geographic location. There are currently no other available facilities on Redstone Arsenal to accommodate the OMMCS mission. Moving these activities to other buildings or ranges, if they were available and had the required safety fans, would appear to have no economic or ecological rationale. It is reasonable to assume that environmental impacts that have occurred at the present Arsenal

locations would be repeated. Similarly, OMMCS operations could have significant impacts in other geographic locations as a result of facility and range construction and operations requirements. Moving OMMCS operations would at best have no significant environmental impacts and at worst have significant impacts depending on the sites/locations chosen.

**No-Action** - In addition to the proposed action, the only other alternative retained and considered was the No-Action Alternative. Under the No-Action Alternative, no plan would exist for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits of comprehensive planning. Existing training activities would continue as scheduled. Under the No-Action Alternative, continued “*status quo*” OMMCS training could potentially impact biological resources (possible loss of suitable and varied flora and fauna habitat), cultural resources (inadvertent destruction of previously unknown resources), and noise (excessive noise impacting the surrounding areas) if field training exercises are conducted with only minimal awareness of the environmental consequences.

**ENVIRONMENTAL EFFECTS:** Eleven broad environmental components were considered to provide a context for understanding the potential effects of the proposed action and a basis for assessing the significance of potential impacts. The areas of environmental consideration are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources. Cumulative impacts of this proposed action were also analyzed.

Mitigation measures are not required for hazardous materials and waste, infrastructure and transportation, land use, and socioeconomics because no impacts have been identified for these resources. Range(s) Standard Operating Procedures will be modified to specify operational/training restrictions around sensitive biological and cultural resources areas. There are no significant impacts to any environmental resources anticipated. In addition, there are no cumulative impacts anticipated under the proposed action.

**CONCLUSION:** We found no significant environmental impacts associated with this action that would require the publication of an Environmental Impact Statement.

DEPARTMENT OF THE ARMY  
UNITED STATES ARMY AVIATION AND MISSILE COMMAND  
REDSTONE ARSENAL, ALABAMA

FINDING OF NO SIGNIFICANT IMPACT  
FOR ENVIRONMENTAL ASSESSMENT OF THE  
U. S. ARMY ORDNANCE MISSILE AND MUNITIONS  
CENTER AND SCHOOL

22 AUGUST 1997

PROPONENT OF THE ACTION:

\_\_\_\_\_  
Date \_\_\_\_\_  
GERALD E. LUTTRELL  
Colonel, U.S. Army  
Commandant

REVIEWED BY:

\_\_\_\_\_  
Date \_\_\_\_\_  
DANIEL J. DUNN  
Natural Resources Team Leader  
Environmental Management Office

PREPARED BY:

\_\_\_\_\_  
Date \_\_\_\_\_  
DON W. CRANFORD  
Safety and Environmental Office  
OMMCS

REVIEWED BY:

\_\_\_\_\_  
Date \_\_\_\_\_  
ROBERT J. SPAZZARINI  
AMCOM Chief Counsel

REVIEWED BY:

\_\_\_\_\_  
Date \_\_\_\_\_  
AMY S. MEREDITH  
Attorney Advisor

FINAL APPROVAL BY:

\_\_\_\_\_  
Date \_\_\_\_\_  
EMMITT E. GIBSON  
Major General, USA  
Commanding

APPROVAL BY:

\_\_\_\_\_  
Date \_\_\_\_\_  
JERRY M. HUBBARD  
AMCOM Environmental Officer

# **EXECUTIVE SUMMARY**

## **INTRODUCTION**

The U.S. Army Ordnance Missile and Munitions Center and School (USAOMMCS) is an ordnance branch service school of the Training and Doctrine Command (TRADOC) and is a tenant of the U.S. Army Aviation and Missile Command (AMCOM) located on Redstone Arsenal.

Facilities and ranges used by OMMCS include the school headquarters/campus and billeting area, two explosive ordnance disposal training ranges -- McKinley Range and Hazardous Devices Demolition (HDD) Range, one explosive ordnance demolition range -- Corkern Range, two Field Training Exercise (FTX) Sites, an inert training Ammunition Supply Point (ASP), a training Corps Storage Area (CSA), a troop obstacle/confidence course, and a training Homing-All-the-Way-Killer (HAWK) Firing Battery Hardstand.

The current OMMCS mission is to train soldiers, marines, and International military students in combat service support military occupational specialties related to munitions management, explosive ordnance disposal, electronic maintenance of communications and missile systems (land combat and air defense missile systems), and test, measurement, and diagnostic equipment arenas. Also, basic and refresher training courses are provided to civilian law enforcement and public safety personnel on explosive ordnance disposal procedures. All training operations and activities have been established at locations that would have minimal effects on other Arsenal functions and adjacent communities.

Future mission operations and activities could include additional combat service support training for land combat and air defense missile systems, munitions management, explosive ordnance disposal, electronic maintenance, or an increase in other training activities from the current level. Future development could support additional facilities at the ranges for new requirements or modernization and replacement of existing facilities. This document would assist in tiering future environmental assessments where no, or only minor, mission changes occur.

## **DESCRIPTION OF THE PROPOSED ACTION**

The proposed action is to continue existing mission training operations using OMMCS buildings and ranges on Redstone Arsenal. Continuing mission activities at Redstone Arsenal avoids the additional environmental, safety, and cost concerns associated with performing the OMMCS mission at another location for execution of the same effort. This action would also include the addition of a 2,200 square foot building and an underground training bunker/tornado shelter located on McKinley Range and the addition of a sanitary sewer system for the ASP Range. The broad OMMCS operational mission would be maintained with new facilities added as required for modernization and replacement of existing facilities. Existing facilities would be renovated or repaired as economic analyses determine.

## **METHODOLOGY**

The purpose of this environmental assessment is to analyze the potential environmental consequences of the proposed action in compliance with the National Environmental Policy Act; Department of Defense Directive 6050.1, *Environmental Effects in the United States of*

*Department of Defense Actions; Army Regulation 200-2, Environmental Effects of Army Actions; and Army Regulation 200-3, Natural Resources—Land, Forests, and Management.*

Eleven environmental components were considered to provide a context for understanding the potential effects of the proposed actions and a basis for assessing the significance of potential impacts. These areas are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

To assess the significance of environmental impacts, a list of activities necessary to accomplish the proposed action was developed. The environmental setting was then described and those activities with the potential for significant environmental consequences were identified. The significance criteria used to evaluate the environmental effects of program activities include three levels of impacts: no impact, no significant impact, and significant impact.

## **RESULTS**

This section summarizes the conclusions of the analyses made for each of the 11 areas of environmental consideration based on the application of the above described methodology.

***AIR QUALITY*** - There would be no significant impacts to air quality anticipated. The locations for the proposed actions have been used for these types of activities for decades. Intermittent construction-related impacts could result from fugitive dust (particulate matter) and construction equipment emissions during construction at McKinley and ASP Ranges. Projected impacts to air quality from the construction of the building and underground training bunker/tornado shelter on McKinley Range and the addition of a sanitary sewer system at the ASP Range are not expected to be significant because fugitive dust and combustion emissions can be mitigated. These emissions are not expected to contribute to the long-term cumulative impacts on air quality of the area.

## ***BIOLOGICAL RESOURCES***

***OMMCS Headquarters Area*** - No significant impacts are expected to the vegetation and wildlife in this area. Since no fish, aquatic resources, threatened or endangered species, wetlands, or unique habitats are known to exist in this area, there are no impacts expected to these resources.

***McKinley Range*** - No significant impacts are expected to vegetation, fish and wildlife, aquatic resources, threatened and endangered species, wetland areas, or unique habitats.

The proposed new building site at McKinley Range is currently a motor park. The area is used for vehicle parking and is unvegetated. The site has been previously disturbed and construction would not be expected to cause detrimental impacts. There would be no impacts to the long-term health and diversity of vegetation resources. Short-term impacts (primarily existing sod removal from around the motor park) are not expected to be significant and can be mitigated by best management practices (e.g., siltation barriers, hay bales) during construction. Short term impacts to wildlife resources during construction are not expected to be significant. The site of the proposed underground training bunker/tornado shelter is on a knoll that has been previously disturbed and construction would not be expected to cause detrimental impacts. Wildlife that use the area may be temporarily displaced during construction by noise and construction activities. Once construction is completed, wildlife would be expected to move back into the area. No fish or

aquatic resources are found at the site. Short term impacts from potential runoff during construction activities would be experienced but are not expected to be significant and can be mitigated by using siltation barriers or hay bales. Wetland areas near the site would be avoided, since they are particularly sensitive to siltation and sedimentation from construction. Since no threatened or endangered species, or unique habitats are known to exist on the proposed sites, there are no impacts expected to these resources.

Corkern Range - No significant impacts are expected to vegetation, wildlife, aquatic resources, or wetland areas on the range; and no fish, threatened or endangered species, or unique habitats are known to exist on the range. The northern boundary of Wheeler National Wildlife Refuge is located on the southern end of this range, but no significant impacts to this area are expected.

ASP Range - No significant impacts are expected to vegetation and wildlife, and no fish, aquatic resources, threatened or endangered species, wetland areas, or unique habitats are known to exist on the range. No significant impacts would be expected to ASP Range vegetation from installing the proposed new sanitary sewer system. While sod would be removed during the installation, this would be replaced in a short time with no impacts expected to the remaining vegetation. No significant impacts would be expected to wildlife resources in the area during construction. Wildlife that use the area may be temporarily displaced during construction due to noise and construction activities. No fish, aquatic resources, threatened or endangered species, wetland areas, or unique habitats are known to exist on the proposed site.

ASP FTX Site - No significant impacts are expected to vegetation and wildlife, and no fish, aquatic resources, threatened or endangered species, wetland areas, or unique habitats are known to exist on the site.

HDD Range - No significant impacts are expected to vegetation, wildlife, or wetland areas on this range, and no fish, aquatic resources, threatened or endangered species, or unique habitats are known to exist on the range.

FTX Site - No significant impacts are expected to vegetation, wildlife, or wetland areas; and no fish, aquatic resources, threatened or endangered species, or unique habitats are known on the site.

HAWK Hardstand Site - No significant impacts are expected to vegetation, wetland areas, and wildlife; and no fish, aquatic resources, threatened or endangered species, or unique habitats are known to exist on the site.

Corps Storage Area - No significant impacts are expected to vegetation and wildlife; and no fish, aquatic resources, threatened or endangered species, wetland areas, or unique habitats are known to exist on the site.

Confidence Course - No significant impacts are expected to site vegetation, wildlife, or aquatic resources. Since no fish, threatened or endangered species, wetland areas, or unique habitats are known to exist on the site, there are no impacts expected from the proposed action.

**CULTURAL RESOURCES** - Cultural resources have not been impacted by previous activities, and no significant impacts are expected from the continuation of training operations. The locations of the OMMCS training activities have been used for these types of activities previously

and there are no known archaeological sites or structures of historical significance located in the specific training areas of the proposed action.

A cultural resource assessment of the proposed construction site at McKinley Range was conducted in May 1995. This survey identified no known cultural resources that might be impacted from construction of the proposed building. The recommended mitigation is that no earth moving activities be conducted west of the motor park because of the archaeological material discovered there in the past. The underground training bunker/tornado shelter will be located on a knoll approximately 800 feet north of Building 8001. This area has been previously disturbed and no mitigative measures are deemed necessary for the placement of this structure. The proposed ASP Range sanitary sewer service is for an existing double-wide trailer located just west of Building 2592. There are no cultural resources identified within this area.

If during construction or training activities, personnel observe items that might have historical or archaeological value, they will report their observations immediately to OMMCS management, who will notify the Arsenal's Cultural Resources Manager to determine their significance and any special disposition of the finds. Construction operations or training activities in that area would cease to prevent trespassing on, removing, or otherwise damaging such resources.

***HAZARDOUS MATERIALS AND WASTE*** - No impacts are expected from the continuation of training operations or from the construction of the structures at McKinley Range and the installation of the sanitary sewer system at the ASP Range.

***HEALTH AND SAFETY*** - No significant impacts are expected to health and safety. Mitigation measures for OMMCS facilities and range operations that are in effect and would be maintained include:

- storage of hazardous materials with flashpoints less than 141° F inside flammable safety cabinets;
- training of personnel per Occupational Safety and Health Administration Hazard Communication Standard (29 Code of Federal Regulations 1910.1200);
- participation of personnel involved in calibration and repair of meters involving radioactive sources in a three week Radiation Protection course;
- minimizing inhalation potential from explosive materials by conducting all demolition activities outdoors;
- instructing personnel to avoid touching sensitive areas of the body when working with explosives and to wash hands after working with explosives (especially before eating);
- using lead vests when working around X-ray machines;
- continuing Arsenal Fire Department stand-by during demolition activities in dry weather; and,
- having Material Safety Data Sheets and chemical inventories available at all locations.

Potential health and safety impacts from construction at McKinley Range and the installation of the sanitary sewer system at the ASP Range would be minimized by using established safety procedures. These include Army Regulation 385-10, *Safety*, and all appropriate Occupational Safety and Health Administration regulations including 29 Code of Federal Regulations Part 1926, *Safety and Health Regulations for Construction*. The building contractor would obtain a National Pollutant Discharge Elimination System construction permit from the Alabama Department of Environmental Management and comply with the permit requirements as well as applicable Federal, state, and local laws and regulations during demolition or construction and when removing and disposing of asbestos-containing or lead-based paint materials.

**INFRASTRUCTURE AND TRANSPORTATION** - There would be no significant impacts to infrastructure and transportation anticipated. The locations of the proposed action have been used for these types of activities previously. The OMMCS training facilities have adequate existing electrical power supplies. There is no natural gas requirement at any of the sites. The existing water and wastewater supplies are in place and adequate, except for the ASP Range sanitary sewer line requirement. Dumpsters would remain in place for basic solid waste disposal. The existing transportation system on the Arsenal would be adequate to serve the proposed activities.

There are no impacts to infrastructure and transportation expected from the proposed action for McKinley Range. There is an existing motor park in the area proposed for the new building and the expected area of development is small for both the new building, the underground training bunker/tornado shelter, and the sanitary sewer system. Additional electrical requirements would be minimal, water lines are in place to the area, additional dumpster requirements would be minimal, and new roads would not be required. There would be no significant impacts expected from the installation of a sanitary sewer system on the ASP Range. The sanitary sewer system would replace the existing portable toilets at the site, protect local groundwater resources and be considered a positive impact. Additional electrical requirements would be minimal, water lines are in place to the area, no additional dumpsters would be required, and new roads would not be required.

**LAND USE** - There would be no significant impacts to land use anticipated due to continued OMMCS training activities. The locations of the OMMCS facilities have been used for these types of training activities previously and there are no changes planned for any of the areas under the proposed action. There are no land use impacts expected from the proposed action to construct the new structures on McKinley Range and a sanitary sewer system at the ASP Range. There is an existing motor park in the area proposed for the new building and the expected area of development is small for both the new building, the underground training bunker/tornado shelter, and the sanitary sewer system.

**NOISE** - There would be no significant noise impacts expected. The locations of the various sites used for OMMCS activities have been used for these types of training activities previously, and the sites are located either within remote areas or inside buildings. Noise impacts from construction equipment activities are not expected to be significant. There are no sensitive noise receptors (e.g., endangered species, hospitals, schools) located near the training sites.

Training activities that produce noise are considered consistent with Arsenal operations. Noise producing activities are not continuous and are similar to past training operations. Training operations are conducted in controlled areas with no significant increase over current operations expected. Entry to training areas is limited to essential personnel (instructors and students). The Arsenal would monitor weather to avoid the use of the ranges when conditions are not favorable (i.e., extreme temperatures, high humidity, high winds, and lightning).

Trained personnel (instructors and students) would follow in-place regulations for hearing protection and noise attenuation. Hearing protection (i.e., foam rubber earplugs and ear muffs) would continue to be used. In some locations (McKinley Range, Corkern Range, HDD Range), thick vegetation around the ranges act as noise barriers during explosives detonations. Corkern Range would continue to use its bunker for additional protection for personnel, when training includes the detonation of 105mm shells. Ear muffs would continue to be used inside Building 2575 at the ASP Range. This building has a paint booth that generates noise. The HDD Range

plans to eventually replace the existing bunker (now unavailable for use due to peeling lead-based paint on the bunker's ceiling) with a concrete bunker for additional protection.

**GEOLOGY AND SOILS** - Geology and soils have not been significantly impacted by previous activities, no significant impacts are expected from continued training operations or the proposed construction at McKinley Range. During construction activities, siltation barriers would be used to minimize sediment runoff to the surrounding areas, particularly to sensitive wetland areas.

**SOCIOECONOMICS** - Socioeconomics has not been significantly impacted by previous activities and no significant impacts are expected from continued operations and the minor construction efforts at the McKinley and ASP Ranges. The overall area population would not be affected (since there would be no significant change in staffing or area population). Local and regional employment outlooks and income would not be expected to change.

**WATER RESOURCES** - Water resources have not been significantly impacted by previous activities and no significant impacts are expected from continued training operations or the proposed construction at the McKinley and ASP Ranges. During construction, siltation barriers would be used to minimize sediment runoff, particularly to sensitive wetland areas.

## **CONCLUSION**

The proposed action would allow the Army to better plan, in an environmentally conscientious manner, future development and modernization of OMMCS facilities. Training in combat service support for munitions, missile maintenance, air defense gun weapon systems, and electronics maintenance, testing, measurement, and diagnostic equipment using existing OMMCS buildings and ranges would continue. Continued training at Redstone Arsenal would avoid the additional environmental, safety, and cost concerns associated with performing the OMMCS mission elsewhere. Proposed new facilities (an approximately 2,200 square foot building and an underground training bunker/tornado shelter on McKinley Range and a sanitary sewer system on ASP Range) represent positive improvements to the OMMCS training support.

Under the No-Action Alternative, no plan would exist for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits of comprehensive planning. Existing training activities would continue as scheduled. Under the No-Action Alternative, continued "*status quo*" OMMCS training could potentially impact biological resources (possible loss of suitable and varied flora and fauna habitat), cultural resources (inadvertent destruction of previously unknown resources), and noise (excessive noise impacting the surrounding areas) if field training exercises are conducted with only minimal awareness of the environmental consequences.

Two additional alternatives considered but eliminated were to use other facilities on Redstone Arsenal or move the OMMCS mission to another geographic location. There are currently no other available facilities on the Arsenal to accommodate the OMMCS mission. Moving these activities to other buildings or ranges, if they were available and had the required safety fans, would appear to have no economic or ecological rationale. It is reasonable to assume that environmental impacts that have occurred at the present Arsenal locations would be repeated. Similarly, OMMCS operations could have significant impacts in other geographic locations as a result of facility and range construction and operations requirements. Moving OMMCS operations would at best have no significant environmental impacts and at worst have significant impacts depending on the sites/locations chosen.

Mitigative measures that have been developed from this environmental assessment have been included in the discussion of each of the resources above. Current range SOPs that guide OMMCS activities were reviewed for this EA. The SOPs were found lacking of language and guidance protective of the resources covered in this assessment. Current range SOPs should be updated to reflect training operations that are conscious of and protective towards these resources. Mitigation measures are not required for hazardous materials and waste, infrastructure and transportation, land use, and socioeconomics because no impacts were identified for these resources.

## LIST OF ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Material
ADEM	Alabama Department of Environmental Management
AMCOM	U.S. Army Aviation and Missile Command
AR	Army Regulation
ASP	Ammunition Supply Point
BET	Basic Electronic Training
BFVS	Bradley Fighting Vehicle System
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CSA	Corps Storage Area
CSS	Combat Service Support
CTT	Common Tasks Training
DOD	Department of Defense
DOT	Department of Transportation
DPW	Directorate of Public Works
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EMP	Environmental Management and Planning
EOD	Explosive Ordnance Disposal
EODTD	Explosive Ordnance Disposal Training Department
EPA	Environmental Protection Agency
ETTD	Electronics Technician and Training Department
EQUATE	Electronic Quality Assurance Test Equipment
FARP	Forward Air Refueling Point
FTX	Field Training Exercise
HAWK	Homing-All-the-Way-Killer
HDD	Hazardous Devices Division
ICUZ	Installation Compatible Use Zone
IFTE	Integrated Family of Test Equipment
mg/m <sup>3</sup>	milligrams per cubic meter
MHE	Material Handling Equipment
MICOM	U.S. Army Missile Command
MLRS	Multiple Launch Rocket System
MOS	Military Occupational Specialty
MSDS	Material Safety Data Sheet
MSTD	Missile Systems Training Department
MTD	Munitions Training Department
MVA	Megavolts Absolute
NAAQS	National Ambient Air Quality Standards
NCO	Non-Commissioned Officer
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NO <sub>2</sub>	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
O <sub>3</sub>	Ozone

OMMCS	Ordnance Missile and Munitions Center and School
OSHA	Occupational Safety and Health Administration
Pb	Lead
PLS	Palletized Load System
PM10	Particulate matter with an aerodynamic diameter less than or equal to 10 microns
PMCS	Preventative Maintenance Checks and Services
POL	Petroleum, Oil and Lubricants
ppm	Parts Per Million
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SO <sub>2</sub>	Sulfur Dioxide
SOP	Standard Operating Procedure
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
TNT	Trinitrotoluene
TOW	Tubular Launched Optical Guided Weapon System
TRADOC	Training and Doctrine Command
USAOMMCS	United States Army Ordnance Missile and Munitions Center and School

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## **APPENDICES**

### **APPENDIX A - CONSULTATION LETTER**

## CHAPTER 1.0

### INTRODUCTION

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The National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) regulations implementing the NEPA (40 Code of Federal Regulations [CFR] 1500-1508); Department of Defense (DOD) Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions* (U.S. Department of Defense 1979); and Army Regulation (AR) 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army 1988), which implements these laws and regulations, direct DOD and U.S. Army officials to consider environmental consequences when authorizing or approving Federal actions. This environmental assessment (EA) analyzes the environmental consequences of continuing training operations of the U.S. Army Ordnance Missile and Munitions Center and School (USAOMMCS).

Section 1.0 of this EA discusses the background for this action, gives a brief description of the proposed action, introduces the purpose and need for the action, notes the location of the action, and highlights issues raised during the assessment process. Section 2.0 discusses project alternatives including the proposed action and compares the environmental consequences of the various alternatives. Section 3.0 describes the affected environment at the locations of the proposed action. Section 4.0 assesses the potential environmental consequences of implementing the proposed action and alternatives; it also highlights cumulative impacts and mitigation measures for each resource. Section 5.0 highlights the conclusions of the assessment, and Section 6.0 contains a list of preparers for this EA. Section 7.0 lists the individuals and agencies consulted during the preparation of this EA and the agencies, organizations, and individuals that were sent a copy of the EA. Section 8.0 contains a list of the references used to prepare this document. Appendix A contains copies of correspondence with consulted agencies.

References are presented in three ways. References presented after a period refer to the preceding paragraph. References presented before a period refer only to information in that sentence. References presented within a sentence refer specifically to the fact they follow.

**1.1 Background.** Redstone Arsenal (Figure 1-1) is located in Madison County, southwest of and adjacent to the city of Huntsville, Alabama. The Arsenal occupies approximately 38,000 acres of land and employs approximately 21,500 government and contractor personnel.

The OMMCS is an ordnance branch service school of the Training and Doctrine Command (TRADOC) and a tenant of the U.S. Army Aviation and Missile Command (AMCOM) located on the Arsenal.

OMMCS facilities and ranges include the school Headquarters/campus and billeting area, two explosive ordnance disposal training ranges - McKinley Range and HDD Range, one explosive ordnance demolition range - Corkern Range, two FTX Sites, an inert training ASP, a training CSA, a troop obstacle/confidence course, and a training Homing-All-the-Way-Killer (HAWK) - Firing Battery Hardstand. (Caudill 1996) Figure 1-2 shows the relative locations and sizes of the three OMMCS ranges. A summary of the acreages and building square footages assigned to OMMCS is shown in Tables 1-1 and 1-2 (Phelps 1996).

Figure 1-1 goes here.

Figure 1-2 goes here

**Table 1-1: OMMCS Acreages**

<b>Training Areas and Ranges</b>	<b>Acres</b>
Training Areas	
Technical Escort	20
FTX	1,000
CSA	400
ASP	328
<b>Subtotal</b>	<b>1,748</b>
Ranges	
Corkern	145
McKinley	735
HDD	63
<b>Subtotal</b>	<b>943</b>
<b>Total Training Areas and Ranges</b>	<b>2,691</b>

**Table 1-2: OMMCS Building Square Footage**

<b>Building Use</b>	<b>Square Footage</b>
Barracks	203,315
General Instruction	45,930
Administration	85,495
Inert Storage	77,727
Technical Escort Training	6,436
Classrooms and Labs	391,409
Miscellaneous	13,994
<b>Total</b>	<b>824,306</b>

Note: There are 120 buildings assigned to OMMCS.

The current OMMCS mission is to train soldiers, marines, and International military students in combat service support (CSS) military occupational specialties (MOSs) related to munitions management, explosive ordnance disposal, electronic maintenance of communications and missile systems (land combat and air defense missile systems), and test, measurement, and diagnostic equipment arenas. Basic and refresher training courses are also provided to civilian law enforcement and public safety personnel on explosive ordnance disposal procedures. Training operations have been established at locations that would minimally effect other Arsenal functions and resources as well as adjacent communities. (Caudill 1996)

Future mission operations and activities could include additional CSS training requirements for land combat and air defense missile systems, munitions management, explosive ordnance disposal, electronic maintenance, or an increase in other training activities from the current level. Future development could support additional facilities at the ranges to accommodate new requirements or modernization and replacement of existing facilities. (Caudill 1996)

OMMCS is composed of the following major organizational elements that conduct training operations and activities that have the potential to effect the environment (Caudill 1996):

- a. The Munitions Training Department (MTD) provides training in receipt, storage, and issue of conventional ammunition; inspection, stock control and accountability of Class V supply; and technical escort operations involving (simulated) chemical agents and munitions, radiological material waived by the Department of Transportation (DOT),

and other hazardous materials. All hazardous materials used (i.e., munitions, radiological materials, chemical agents) are inert or simulated only. MTD conducts training operations in the following locations on Redstone Arsenal:

- (1) The ASP is approximately 328 acres in size, consisting of an Army tactical vehicle motor park, (i.e., material handling equipment such as forklifts and cranes), Palletized Load System (PLS) vehicles, and various other equipment used in handling conventional (Class V) ammunition; a large unimproved (gravel) road network; and several buildings used as classrooms for training, written examinations, and practical exercises (such as banding and stenciling). Also located in this area is a FTX site, used primarily to train soldiers in common soldier/leader development skills.
  - (2) The CSA is located in the southern portion of Redstone Arsenal and consists of approximately 400 acres. Ammunition (inert) handling, storage, issue, receipt, inspection, stock control and accountability training activities are conducted within a 15 magazine (igloo) area. Moving training ammunition involves using Army (tactical) military vehicles and material handling equipment (MHE). Vehicles and MHE (forklifts) are moved on unimproved (gravel) type roads throughout the CSA.
  - (3) Corkern Range consists of approximately 145 acres and is used to train ammunition-type MOSs within the active Army, Marine Corps, National Guard, Army Reserve, and Allied students in the disposal of unserviceable ammunition generated at ASPs and the emergency destruction of an ASP during war or other-than-war conditions. Explosive limits for this range are 10 lbs net explosive weight above ground, 15 lbs net explosive weight underground, and 25 lbs propellant burn. Types of explosive (Class V) materials used on the range consist of 105MM Artillery Cartridge without fuze, M60 time fuze ignitors, M700 time fuze, detonating cord, electric and non-electric blasting caps, demolition charges consisting of .25 lbs of trinitrotoluene (TNT) and 1.25 lbs of Composition C-4, and various color smoke hand grenades.
  - (4) The Railcar/Forklift Training Area is located near the Headquarters/school campus. A single railcar is used to train the up-loading and off-loading of Class V ammunition (inert) using a simulated rail head. MHE used during this training consist of both diesel and electric powered forklifts.
  - (5) The Technical Escort Training Area is used to conduct training operations to provide the DOD a worldwide capability for escorting chemical agents and munitions, radiological materials waived by the DOT, and other types of hazardous materials. Personnel taught here are U.S. Military, Department of the Army or contract civilians, and selected International Military personnel whose duties require close contact with surety or hazardous materials. All hazardous materials (i.e., munitions, radiological materials, chemical agents) are inert or simulated only.
- b. The Missile Systems Training Department (MSTD) provides training in electronics and mechanical/hydraulics maintenance for Land Combat and Air Defense weapons systems. Examples of the various types of systems are the Multiple Launch Rocket System (MLRS); HAWK Air Defense Missile System; Bradley Fighting Vehicle System (BFVS) with mounted Stinger Air Defense Missile System; the Tubular-Launched, Optical-Guided Weapon System (TOW) Mounted Missile System; and the Avenger Air Defense Missile System. Additionally, MSTD conducts training on various types of electronic test and diagnostic equipment used to maintain or repair these missile systems. The majority of MSTD classroom, laboratory, and high-bay training facilities are located in buildings along Zeus Drive and Mauler Road in the Headquarters/school campus area. MSTD conducts

training on the HAWK Air Defense Missile System at the HAWK Hardstand located off Hansen Road. FTXs are also conducted by MSTD in the Training Area off Hansen Road.

- c. The Electronics and Technology Training Department (ETTD) conducts technical and basic electronics training (BET) in electronics, missile maintenance, and test, measurement, and diagnostic equipment (TMDE) repair. The ETTD is housed in Buildings 3495, 3449, and 3450. Building 3495 contains the department's administrative office and the Electronics Division. The electronics division teaches specialized blocks of instruction on electronic components and circuits, schematic analysis, and troubleshooting techniques. The Computer Division, located in Building 3450, provides training in computer logic, basic programming, central processor unit, and other computer selected subjects. The Advanced Technology Division, located in Building 3449, provides training in soldering, circuit board repair, wire wrap and cable repair, mechanical skills (general shop), and radiological protection.
- d. The Explosive Ordnance Disposal Training Department (EODTD) conducts training in the Headquarters/school campus area (Buildings 3459 and 3460), McKinley and HDD Ranges.
  - (1) Buildings 3459 and 3460 are primarily used for classroom and laboratory (practical exercises using inert training materials).
  - (2) The McKinley Range is used to train the Phase III portion of the 55D MOS. Students train on various types of EOD equipment and tools, such as robotics, small equipment excavator vehicles, mine detectors, ordnance locators, and communications equipment. Explosive materials (Class V) used on this range are similar to those used on Corkern Range and are used to simulate/train the removal of lodged projectiles and disarm/dispose of various missiles. The Non-Commissioned Officer (NCO) Academy also uses this range to conduct 55D MOS Basic and Advanced NCO courses. This training consists of FTXs, simulated incidents involving ordnance and chemical munitions, and leader development courses.
  - (3) The approximately 63 acre HDD Range is used to train civilian law enforcement and public safety personnel in the design, construction, render safe, and disposal of hazardous explosive devices and other explosive materials. This range is used approximately 128 days per year for demolition instruction using both military and civilian explosives materials (similar to Corkern and McKinley Ranges).

Other OMMCS organizational elements primarily perform administrative, training product development, and other functions related to the operation of a TRADOC service school.

All range operations are governed by documented Standard Operating Procedures (SOPs) including SOP No. 96-04, *Division Training Operations, Training Ammunition Supply Point Operations*, SOP No. 96-12, *Corkern Range, Conventional Ammunition Hazardous Operations*, and SOP 95-1, *Missile System Training Department, Field Training Exercise*. All ranges used for ordnance demolition training are coordinated through and approved by the MICOM Safety Office. Timber removal is directed by the Installation Forester through the Directorate of Public Works (DPW). All environmental compliance issues regarding cultural resources (soil excavation and soil placement), wetland areas (including mechanical clearing), and significant natural areas that might be impacted by OMMCS activities are handled by the Directorate of Environmental Management and Planning (EMP).

**1.1.1 Description of the Proposed Action.** The action proposed by the OMMCS and evaluated in this EA would continue existing mission training operations using OMMCS buildings and ranges on Redstone Arsenal. The proposed action would be undertaken in accordance with the

1994 Redstone Arsenal Master Plan EA that provides a management tool to aid in making operational support decisions by incorporating the concept of comprehensive planning. Continuing mission activities at Redstone Arsenal would avoid the additional environmental, safety, and cost concerns associated with performing the OMMCS mission elsewhere for execution of the same effort. This action would also include the addition of a 2,200 square-foot building and an underground training bunker/tornado shelter on McKinley Range and the addition of a sanitary sewer system for the ASP Range. The broad OMMCS operational mission would be maintained with new facilities added as required for modernization and replacement of existing facilities. Existing facilities would be renovated or repaired as economic analyses determine. This document would assist in tiering future environmental assessments where no, or only minor, mission changes occur.

**1.1.2 Purpose and Need for the Action.** The purpose of this action is to continue OMMCS training operations using existing facilities on Redstone Arsenal in an effective and environmentally sound manner. The need is the defined OMMCS mission to train soldiers, marines, and International military students in CSS MOSs related to munitions management, explosive ordnance disposal, electronic maintenance of communications and missile systems and test, measurement, and diagnostic equipment arenas; and to provide civilian law enforcement and public safety personnel training on explosive ordnance disposal procedures.

**1.1.3 Location of the Proposed Action.** OMMCS facilities are located at various sites on Redstone Arsenal. These include the OMMCS Headquarters area, McKinley Range, Corkern Range, the ASP site (including the main ASP Range and the ASP FTX site), the CSA, confidence course, HDD Range, FTX site, and the HAWK Hardstand site. The OMMCS Headquarters area includes the immediate Headquarters buildings, the Railcar/Forklift Training Area, the MTTD buildings, the ETTD buildings, Buildings 3459 and 3460 of the EODTD, the Technical Escort Training Area, and the troop billeting area.

**1.2 Related Environmental Documentation.** Related environmental documentation reviewed:

- U.S. Army Missile Command, *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*, 1994a.
- Alabama Natural Heritage Program *Draft Natural Heritage Inventory of Redstone Arsenal: Federally Listed Endangered, Threatened, Candidate and State-Listed Species*, 1995
- “*Mapping Report for United States Army, Redstone Arsenal*,” Geonex Corp., 1995.

**1.3 Agencies Involved in Environmental Analysis.** The U.S. Fish and Wildlife Service (USFWS) and the Alabama State Historic Preservation Office (SHPO) have been consulted to determine their concerns regarding the proposed action. Copies of any consultation letters received are located in Appendix A.

**1.4 Public Involvement.** There will be a 30-day comment period after the Notice of Availability of this EA is published in the local newspaper. Other Federal, state, and local agencies are not currently involved in the planning of this action.

## CHAPTER 2.0

### ALTERNATIVES INCLUDING THE PROPOSED ACTION

---

**2.1 Summary of Alternatives.** During the planning stage for the proposed action, only the No-Action Alternative was considered and retained. This Alternative, as well as the proposed action, were assessed for potential impacts to the environment and described in the following sections.

#### **2.2 Description of Alternatives Including the Proposed Action**

**2.2.1 Alternative 1 - Proposed Action.** The action proposed by OMMCS and evaluated in this EA is the continuance of existing mission training operations using OMMCS buildings and ranges on Redstone Arsenal. This action would also include the addition of a 2,200 square foot building and an underground training bunker/tornado shelter located on McKinley Range and the addition of a sanitary sewer system for the ASP Range. The broad OMMCS operational mission would be maintained with new facilities added as required for modernization and replacement of existing facilities. Existing facilities would be renovated or repaired as economic analyses determine. This document would assist in tiering future environmental assessments where no, or only minor, mission changes occur.

OMMCS facilities are located at various sites on Redstone Arsenal (Figure 2-1). These include the OMMCS Headquarters area, McKinley Range, Corkern Range, the ASP site (including the main ASP Range and the ASP FTX site), the CSA, confidence course, HDD Range, FTX site, and the HAWK Hardstand site. The OMMCS Headquarters area includes the immediate Headquarters buildings, the Railcar/Forklift Training Area, the MTTD buildings, the ETTD buildings, Buildings 3459 and 3460 of the EODTD, the Technical Escort Training Area, and the troop billeting area. A discussion of these sites follows.

**2.2.1.1 OMMCS Headquarters Area.** The OMMCS Headquarters area is shown in Figure 2-2. Current OMMCS staff totals 137 civilians and 423 military personnel. No additional training personnel are expected as a result of the proposed action. The OMMCS school area is highly developed and was disturbed by clearing and earthmoving decades ago, therefore it does not impact wetland areas, cultural sites, or wildlife, except in the sense that only urban wildlife can exist in very marginal border plantings at the school. Existing buildings that comprise the OMMCS Headquarters area facilities are listed in Table 2-1. Most facilities within the Headquarters area are indoor facilities. There is one outdoor facility within this area (the Technical Escort Training Area). None of these buildings significantly impact wetland areas. Roads within the headquarters area are paved. No new construction is expected within this area as part of the proposed action.

The Railcar/Forklift Training Area includes Building 3332 (Figure 2-2), a classroom located within a fenced area used for forklift training. A single railcar is used to train the uploading and off-loading of Class V ammunition (inert) using a simulated rail head. MHE used during this training consists of both diesel and electric powered forklifts. There are additional vehicles parked within the fenced area that are not used for training. There are no petroleum, oil, and lubricant (POL) activities in this area.

**Table 2-1: OMMCS Headquarters Area Facilities**

- |   |
|---|
| <ul style="list-style-type: none"><li>• Building 3300 - OMMCS command and staff offices</li></ul> |
|---|

• Building 3301 - OMMCS staff and faculty offices
• Building 3303 - MSTD administrative office
• Building 3304 - electronics testing - contains electrical trailers, classrooms, and offices
• Building 3306 - MLRS training
• Building 3308 - HAWK training
• Building 3310 - lithium battery storage - adjacent to Buildings 3303 and 3318
• Building 3314 - storage building adjacent to Building 3306
• Building 3318 - MSTD central supply building - located directly behind Building 3303
• Building S3327 - hazardous waste storage (90-day permitted storage facility) - near Building 3308
• Building 3328 (Barclay Hall) - classroom training for Bradley Fighting Vehicles and Avenger systems
• Building S3335 - hazardous waste storage (90-day permitted storage facility) - located behind Building 3328
• Buildings 3449/3450: ETTD - offices and classrooms. Classroom 1: gold plating (electroplating or soldering) training Classrooms 2 and 6: lead soldering training Classroom 3: calibration of meters (radioactive materials stored here) Classroom 4: machine shop and soldering training area Room 5: offices
• Buildings 3459/3460 - classrooms related to the EODTD operations
• Building 3495 - offices related to the ETTD operations
• Building 3534 - Technical Escort Training Area - classrooms/office space

The Technical Escort Training Area is used to conduct training operations to provide the DOD a worldwide capability for escorting chemical agents and munitions, radiological materials waived by the DOT, and other types of hazardous materials. Personnel taught here are U.S. Military, Department of the Army or contract civilians, and selected International Military personnel whose duties require close contact with surety or hazardous materials. All hazardous materials (i.e., munitions, radiological materials, chemical agents) are inert or simulated only.

The training area is located on approximately 20 acres. The main fenced training area contains approximately 6 acres. Training classes (6-7 per year) contain approximately 25 students each and last for 24 days. Building 3534, the main building in this area, is used for offices, classrooms, and laundry rooms. Additional buildings on the six-acre site (Buildings 3533, 3535, 3536, 3539, 3540, and 3541) that are used predominantly for storage. Building 3533 is the satellite accumulation point for hazardous wastes within this training area. A fenced area (numbered TS3537) is an old exclusion area from previous site activities and is also a Solid Waste Management Unit (SWMU) identified as RSA-47. (Geraghty and Miller 1991)

Buildings 3410, 3411, 3412, and 3413 are barracks located off Patton Road (Figure 2-2) for ASP staff and students. Building 3410 contains a Small Arms Secure Storage Room. Small arms are used for soldier familiarization and proficiency. The bay area inside Building 3410 is used for cleaning and preventative maintenance of weapons.

Figure 2-1 goes here.

Figure 2-2 goes here

**2.2.1.2 McKinley Range.** McKinley Range (Figure 2-3) is for training and testing EOD technicians in related technical tasks. The range is approximately 735 acres in size, contains 42 static training sites, has approximately 26 miles of unimproved roadways, and has been in operation for over 30 years. Major McKinley Range training sites are listed in Table 2-2. Most training sites contain “mock-up” facilities and equipment to simulate situations the student may encounter during their follow-on assignments. Equipment mock-ups are mostly static displays and have had fluids drained to avoid accidental releases.

McKinley Range is used to train the Phase III portion of the 55D MOS. Students train with various types of EOD equipment and tools, such as robotics, small equipment excavator vehicles, mine detectors, ordnance locators, and communications equipment. Explosive materials (Class V) used are similar to those used on Corkern Range and are used to simulate/train the removal of lodged projectiles and disarm/dispose of various missiles. The NCO Academy also uses this range to conduct 55D MOS Basic and Advanced NCO courses. This training consists of field training exercises, simulated incidents involving ordnance and chemical munitions, and leader development courses. National Guard units also use the range on a periodic basis on selected weekends. Demolition training sites for live ordnance are located in three areas: the Peace Talks site, Phase 3 dig site, and the Telecom Loop site. There is a limit of five pounds net explosive weight for any explosive used on the range. McKinley Range has approximately 350 students per year. Classes are from 7 to 11 days in length and have instructor/student ratios of 1 : 3 both in the classroom and field training phases.

Range operations are supported from Building 8002 (Range Control). This building is also occasionally used for minor general shop operations such as welding, grinding, sanding, and touch-up painting. Building 8001 is used for classrooms and storage. Approximately 30 vehicles ranging from heavy equipment to pickup trucks are stored at the motor park adjacent to Building 8001. Small amounts of POL products are used and/or stored on McKinley Range to support these vehicles during training. Only preventative maintenance checks and services (PMCS) types of maintenance are performed at this location.

The Geonex wetland mapping report (1995) indicates that approximately sixty percent of the range is considered wetlands. One major canal runs from north to south along Canal Road through the middle of the range. There are additional smaller branch canals located on the range. The drainage of these canals has been affected by beavers which are expanding the wetland acreage at McKinley Range. Two cemeteries, Simpson Cemetery (a fenced area without headstones) in the northwest portion of the range and Lynch Cemetery (a fenced area with one headstone) located on the range southeast of Building 8001. Both cemeteries are well marked and maintained. Training activities do not encroach upon either cemetery.

There is a proposal for a new building to be built in the motor park west of Building 8001. This building would be sited on part of the existing motor park site, southwest of Building 8001. The proposed one level building would be approximately 2,200 square feet in size. It would be used for administrative functions, minor vehicle maintenance activities within enclosed vehicle bays, and contain an outside vehicle wash rack located under the building overhang. The wash rack area would have an oil/water separator allowing the used water to flow into the Arsenal sanitary sewer system. This building is proposed as a modern replacement for Building 8002.

**Table 2-2: McKinley Range Training Sites**

• Expanded 5-ton truck site
• Mock airfield site - numerous individual sites including an airfield control tower, M48 tank, bomb dump, Vulcan guns, OV-1 aircraft, F-4 aircraft, airfield POL site, and EOD sites
• Building 7850 - old command center building
• Tank park - various tanks and related vehicles
• Rock Pond - field exercises are held in this area; no training is done on/in the pond
• Peace talks site - wooden building in the woods
• Telecom loop site - wooden building in the woods
• Ambush site - vehicles scattered along the road as a result of a simulated ambush
• Eight inch gun site
• MASH bus site
• HAWK and Mauler sites
• ASP site - contains a truck and numerous trailers simulating an ammunition supply point
• Radar site
• 81mm mortar pit site
• M151 jeep site
• Sand pit site
• 105mm gun site
• Eight inch gun site
• 4.2 inch mortar site
• Five ton truck site (with trailer)
• FARP (Forward Air Refueling Point) site - simulates a forward area used for refueling and rearming aircraft and helicopters - contains fuel trucks, helicopters, and temporary steel runway materials
• Burn pit - used for burning wood/tree limbs that fall during inclement weather
• Foreign vehicle site
• Ammunition Assembly Building site - also used for booby trap simulation in the nearby area
• Phase 3 dig site - inert bombs embedded in this area - live ordnance training also conducted in other parts of this site
• Santa Monica Road - no training sites here - numerous outdoor storage sites along this road
• Simpson Cemetery site - one tracked vehicle outside of the fenced cemetery
• Robot site - building/small metal tower used for robot simulation activities

Figure 2-3 goes here

There is also a proposal to install an underground training bunker/tornado shelter on McKinley Range. This structure would occupy an approximately 100 foot x 60 foot area on a knoll approximately 800 feet north of Building 8001. This area has been previously disturbed by earth moving activities. The structure is intended to simulate a tunnel complex to be used for booby trap training procedures for the military. This structure would also serve as a tornado shelter during periods of severe weather. The main part of the tunnel complex would be constructed with 40 foot lengths of 6 foot diameter concrete pipe, which could hold 40 people (facing each other) when used as a tornado shelter.

**2.2.1.3 Corkern Range.** Corkern Range (Figure 2-4) consists of approximately 145 acres used to train ammunition type MOSs in the active Army, Marine Corps, National Guard, Army Reserve and Allied students in disposal of unserviceable ammunition generated at ASPs and emergency destruction of an ASP during war or other-than-war conditions. Range explosive limits are 10 lbs net explosive weight above ground, 15 lbs net explosive weight underground, and 25 lbs propellant burn. Types of explosive (Class V) materials used on the range consist of 105MM artillery cartridge without fuze, M60 time fuze ignitors, M700 time fuze, detonating cord, electric and non-electric blasting caps, demolition charges consisting of .25 lb TNT and 1.25 lb of Composition C-4 and various color smoke hand grenades. (Caudill 1996)

The main range used for training activities (located off of Hansen Road) is approximately 30 acres in size. The overall range is 145 acres, of which much of the forested acreage is wetlands. No new construction is expected on the range as part of the proposed action, and no ammunition storage points are located on the range. Range roads are unimproved roadways. Corkern Range contains a sand-filled demolition line used for the TNT demolition. Five small, circular, concrete block enclosed demolition points (no longer used) are approximately 100 feet from the sand line. Nearby are two small man-made ponds previously used for underwater demolition training. This particular training has been discontinued. In the northeast area of the range is a small display of inert ammunition (boxes of fuzes and 105mm shells) used to demonstrate the proper method to destroy large quantities of ammunition in an emergency battlefield situation. An area at the rear of the range is used to detonate 105mm cartridges, which are buried four feet in the ground.

Range operations are supported from Building 5389 that contains administrative and classroom facilities. Building 5391 is a covered area used for outside seating on bleacher-type seats. Building 5392 is a concrete block bunker located next to structure 5391. There are two small storage trailers located near Structure 5392.

Corkern Range trains approximately 1,200 to 1,400 students per year. Classes have up to 34 students per class with instructor/student ratios of 1 : 34 in the classroom and 1 : 1 at range points and downrange firing points. No additional training is expected.

**2.2.1.4 ASP Site.** The approximately 328 acre main ASP Range (Figure 2-5) is located to the west of Rideout Road and north of Overlook Road, in the northwest portion of the Arsenal. Range operations are supported from Building 2592. Several CONEX containers are located throughout the main range and various training areas (e.g., Hardware Performance Test Station) are scattered throughout the range. A fenced motor park containing up to 60 pieces of

Figure 2-4 goes here

Figure 2-5 goes here

equipment (including generators) is located to the west of Building 2592. Building 2592G is a trailer located to the east of Building 2592 used for classroom training. Building 2575 is a maintenance building located to the north of Building 2592. There are two small unnumbered storage buildings to the east of Building 2592.

The ASP site consists of an Army tactical vehicle motor park for material handling equipment (such as forklifts and cranes), Palletized Load System (PLS) vehicles, and various other types of equipment used in handling conventional (Class V) ammunition; a large unimproved (gravel) road network; several buildings used as classrooms for training, written examinations, and practical exercises (such as banding and stenciling). An FTX site located in this area is used primarily to train soldiers in common soldier/leader development skills. (Caudill 1996)

The ASP sites handle approximately 1,500 soldiers and 300 Marines per year. Classes have between 6 and 24 students and lasts for five weeks. Only inert ammunition is used during training activities. No additional training personnel are expected as a result of the proposed action.

The ASP FTX site (Training Area #3) is a grassy area approximately six acres in size to the west of the main ASP Range (Figure 2-5). It is used for field training including overnight exercises.

There is a proposal for a new sanitary sewer system at the ASP Range to service a double-wide trailer just west of Building 2592. Portable toilets are currently used at the ASP Range.

**2.2.1.5 HDD Range.** The HDD Range (Figure 2-6) is used to train civilian law enforcement and public safety personnel in the design, construction, safe render, and disposal of hazardous explosive devices and other explosive materials. This range is used approximately 128 days per year for demolition instruction using both military and civilian explosives materials (similar to Corkern and McKinley Ranges). (Caudill 1996)

The main range (located south of Buxton Road) is approximately 63 acres in size and has a 327 acre exclusion zone (controlled by MICOM) surrounding the range. Range roads are unimproved roadways. Major training sites for the HDD Range are listed in Table 2-3.

**Table 2-3: Major HDD Range Training Sites**

• Building 8976A - used for personnel when possible fragmentation may occur
• One 50'x12' mobile home - used for training activities (simulated drug lab) and storage
• 8 portable metal buildings - used as practical exercise labs
• Demolition sand line - used for detonating explosives training
• 8 above ground crosstie pits - used for firing disrupters into pits
• White sandbagged area - used by MICOM Propulsion Laboratory for rocket motor testing
• Building 3445 and 3446 - classroom training areas
• Simulated booby-trapped marijuana field located in the trees adjacent to the main range

The HDD Range contains eight static training sites, nine firing points, disrupter pits, and a sand-filled demolition line. Range operations are supported from Building 8976 that contains classrooms, storage and break areas. Bunker 8976A is used with firing range activities. Building 8968 (formally an ammunition bunker) and Building T8969 are used for storage.

Figure 2-6 goes here.

There are numerous static displays that were obtained from the Defense Reutilization Marketing Office (DRMO) located on the HDD Range. These displays are free of fluids (e.g. gas, oil, antifreeze) to prevent environmental damage. Displays include a mailbox, cars, trucks, and an ambulance. Simulated explosives are used in the static displays, and in some cases live explosives are used. There is a limit of 2.5 pounds net explosive weight for any explosive used on the range. Explosive materials are not stored on the range. Materials used during a day of training are brought in each morning and removed at the end of the training day.

A broad range of technical training and associated activities are conducted on the HDD Range. The HDD Range has approximately 400 students per year during course activities. Classes are 1 to 4 weeks in length and have approximately 16 to 24 students per class. Classes have instructor/student ratios of 1 : 24 in the classroom (up range), 1 : 3 at the firing points (range points), and 1 : 1 on the firing line (down range). Range classes include the “Basic Civilian Competence Confidence Course” and the “Civilian Competence Confidence Refresher Course.”

The HDD Range includes palustrine forested wetland areas and sloughs that are the result of spring runs that have been, in part, blocked by beaver dams. Only when water on Wheeler Reservoir is high does it affect this area. There are no night/weekend bivouacs or field training exercises conducted on the range, and no bulk petroleum products stored at the range.

**2.2.1.6 FTX Site.** The FTX site (Figure 2-7) is used for training in PMCS vehicle maintenance, simulated missile operations, the use of pyrotechnics, perimeter defense, shop operations, and system fighting positions. The soldiers’ performance is evaluated on specific missile weapons systems in a tactical environment. Systems used are listed in Table 2-4. The site is used to conduct Common Tasks Training (CTT) which includes foot patrols, simulated chemical/biological/radiation attacks (using smoke grenades), and squad tactics.

**Table 2-4: Systems used at the FTX Site**

• Multiple Launch Rocket Systems (MLRS)
• Bradley Fighting Vehicle System (BFVS)
• Integrated Family of Test Equipment (IFTE)
• Electronic Quality Assurance Test Equipment (EQUATE)
• Tubular Launched Optical Guided Weapon System (TOW)
• Avenger Air Defense Weapons System

The FTX site is located off Hansen Road in the northeast portion of Redstone Arsenal. It covers approximately 1,000 acres and includes wetland areas, open fields, wooded areas, foxholes, and unimproved roads. The open fields are used to set up wheeled vehicles, while tracked vehicles are used in nearby areas. Building 3755 (actually two small portable trailers) is used as storage.

Range personnel indicate that no field training exercises take place in any of the areas they consider to be wetlands on the FTX Range. Excavation (e.g., tent pads, foxholes) of selected areas on the site is done as part of training exercises. This includes digging for tent pads that are six inches deep and foxholes that are six feet deep. No cemeteries are known to exist on this site.

Figure 2-7 goes here.

**2.2.1.7 HAWK Hardstand Site.** The HAWK Hardstand site (Figure 2-7) consists of approximately 10 acres located off Hansen Road in the northeast portion of Redstone Arsenal. This site has numerous paved areas where HAWK missile system firing batteries have been set up for training. Open fields comprise the remainder of the site. Range operations are supported from Building 3760. No ammunition storage points are located at the site and no new construction is expected as part of the proposed action.

**2.2.1.8 Corps Support Area (CSA)** The CSA is located in the southern portion of Redstone Arsenal near the Tennessee River (Figure 2-8) and consists of approximately 400 acres. Ammunition (inert) handling, storage, issue, receipt, inspection, stock control and accountability training activities are conducted within a 15 magazine (igloo) area. The movement of training ammunition involves the use of Army (tactical) military vehicles and MHE. The movement of vehicles and MHE (forklifts) is on unimproved (gravel) type roads throughout the CSA.

**2.2.1.9 Confidence Course.** The confidence course (Training Area E-North) is a 10 acre site located off Hansen Road (Figure 2-7). This area is partially wooded containing an obstacle course used for student confidence training. There are no tactical vehicles or buildings on this site.

**2.2.2 Alternative 2 - No-Action Alternative.** Under the No-Action Alternative OMMCS operations would continue without the benefits of comprehensive planning. No plan would exist for the future development and modernization of OMMCS facilities. The OMMCS training activities would continue as scheduled but the training areas would be subjected to potential impacts to biological resources (possible loss of suitable and varied flora and fauna habitat), cultural resources (inadvertent destruction of previously unknown resources), and noise (excessive noise impacting the surrounding areas) if field training exercises were conducted without regard to environmental consequences.

**2.3 Comparison of Environmental Consequences.** While there are expected to be impacts to air quality, biological resources, cultural resources, health and safety, noise, geology and soils, and water resources, these impacts are expected to be not significant and mitigable. A comparison the environmental consequences of the alternatives by individual resource is presented in Table 5-1.

**2.4 Alternatives Eliminated From Further Consideration.** There were two additional alternatives considered that were eliminated from further consideration. A brief synopsis of these alternatives follows.

**2.4.1 Use of Other Facilities and Ranges on Redstone Arsenal.** This alternative would provide the total requirement for facilities and ranges in other existing or new facilities and relocate existing ranges to other portions of Redstone Arsenal. There are currently no buildings or ranges available to relocate OMMCS mission activities. The Army is rehabilitating old facilities and constructing new facilities needed to move additional organizations to Redstone Arsenal under Base Closure and Realignment. Impacts to the resources in the areas that OMMCS currently occupies occurred decades ago when the areas were established. If a location for these same facilities were being sought today under current environmental regulations, the likelihood that the OMMCS facilities would end up in their present locations, amid environmentally sensitive areas, is remote. There would be no apparent economic or ecological reason to relocate OMMCS locations and repeat these impacts at other sites on the Arsenal.

Figure 2-8 goes here

Additionally, several existing OMMCS ranges have safety arcs that would make siting elsewhere on the Arsenal difficult.

Moving OMMCS operations to other facilities and ranges on Redstone Arsenal would not appear to reduce environmental impacts below the levels anticipated at their current sites, and would unnecessarily disrupt current mission operations and increase dollar costs to the government associated with construction of new facilities and ranges or modification to existing facilities and ranges.

**2.4.2 Move the OMMCS Mission to Another Location.** This alternative would move the OMMCS mission and operations to another military facility within the U.S. No significant impacts have been found associated with the OMMCS mission and continued operations at Redstone Arsenal. Similar environmental impacts would be expected at any other geographic location where the actions could be conducted. OMMCS operations could potentially have significant impacts in other geographic locations as a result of facility and range construction and operational needs, if completed in proximity to important sensitive environmental resources. It is the conclusion of this EA that moving OMMCS mission operations to another installation would not appear to reduce environmental impacts below the level anticipated at Redstone Arsenal.

## CHAPTER 3.0

### AFFECTED ENVIRONMENT

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This section describes the environment potentially affected by the proposed action. The affected environment is described to provide a context for understanding potential impacts. Components of the affected environment that are of greater concern are described in greater detail.

Available literature (such as EAs and installation master plans) was acquired. To fill data gaps and to verify and update available information, installation personnel and Federal, state, and local regulatory agencies were contacted. Cited literature, telephone interviews, and referenced material are presented in Section 8.0.

Eleven broad environmental components were considered to provide a context for understanding the potential effects of the proposed action and a basis for assessing the significance of potential impacts. Several of these environmental components are regulated by Federal and/or state environmental statutes, many of which set specific guidelines, regulations, and standards. The standards provide benchmarks for determining the significance of environmental impacts. The compliance status of each project area with respect to environmental requirements was included in the information collected. The areas of environmental consideration are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

#### 3.1 AIR QUALITY

**Region of Influence (ROI)** - The ROI is Redstone Arsenal and the immediate surrounding area.

**Affected Environment** - The Air Quality Act of 1967, commonly referred to as the Clean Air Act (CAA), was designed to protect and enhance the quality of the nation's air resources. This Act, along with amendments adopted in 1970, 1977, and 1990, serves as the basis for air quality standards. The National Ambient Air Quality Standards (NAAQS), which were established by the Environmental Protection Agency (EPA) and mandated by the CAA, are the standards for ambient concentrations of the criteria pollutants: sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM<sub>10</sub>), and lead (Pb). The NAAQS concentrations are ceilings which may not be exceeded. The NAAQS and Alabama Air Quality Standards are shown in Table 3-1. Areas are classified in one of three categories:

- Attainment - better air quality than required by standards;
- Non-attainment - worse air quality than required by standards; and
- Attainment unclassified - insufficient data available for the area to warrant non-attainment status and justify attainment status.

Criteria pollutants are those chemicals for which ambient air quality standards have been promulgated. These criteria pollutants are emitted primarily from combustion sources such as power plants, boilers, aircraft engines, automotive engines, solid waste incinerators, and burn pits. These pollutants are regulated and controlled so that the concentration does not exceed either short-term or long-term standards. Under the CAA, Federal actions must not cause or contribute to any new violation of air quality standards, increase the frequency or severity of any existing violation, or delay the timely attainment of any air quality standard or interim milestone.

Non-criteria pollutants are all other air pollutants that are regulated and controlled by emission standards or other health-risk-based criteria. As the various portions mandated by the 1990 CAA Amendments are promulgated by the EPA, the number of regulated pollutants has continued to grow. These pollutants may be emitted from many different sources, such as the use of solvents in paint, automobile maintenance, and metals and organic emissions from solid waste incineration activities.

Air quality in a given location is described by the concentrations of various pollutants in the atmosphere, expressed in units of parts per million (ppm) or milligrams per cubic meter (mg/m<sup>3</sup>). Pollutant concentrations are determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and meteorological conditions related to the prevailing climate. The significance of a pollutant concentration is determined by comparison with Federal, state, and local ambient air quality standards. These standards establish limits on the maximum allowable concentrations of various pollutants in order to protect public health and welfare.

**Table 3-1: National and Alabama Ambient Air Quality Standards (Same Figures)**

Pollutants	Averaging Period <sup>a</sup>	Ambient Air Quality Standards (ug/m <sup>3</sup> ) <sup>b</sup>	Background Concentration (ug/ m <sup>3</sup> )
Sulfur Dioxide	3 hours	---	---
	24 hours	365	86
	Annual	80	---
Total Suspended Particulates (PM10)	24 hours	150	36
	Annual	50	---
Carbon Monoxide	1 hour	40	6.5
	8 hours	10	5.0
Ozone	1 hour	235	1.0
Nitrogen dioxide	Annual	100	---
Lead	Calendar quarterly mean	1.5	---

<sup>a</sup> - Arithmetic average except in the case of total suspended particulate matter.

<sup>b</sup> - Expressed in micrograms per cubic meter.

The NAAQS have been adopted by the State of Alabama and the City of Huntsville. Redstone Arsenal is located in Madison County, which is in the Tennessee River Valley - Cumberland Mountains Air Quality Control Region. The Madison County area has an attainment unclassified designation for all primary and secondary pollutant standards stipulated under the NAAQS. (U.S. Army Missile Command 1994a)

The State of Alabama issues air permits for Redstone Arsenal. Operations subject to air permit regulations include boilers, petroleum storage tanks, and propellant sparging units. Each permitted emission course on Redstone Arsenal is in compliance with the terms of the permit. (U.S. Army Missile Command 1994a)

Approximately 2,000 acres of open ranges and forests are programmed for burning each year in coordination with the Installation Forester of the Department of Public Works and mission user personnel. This prescribed burning is conducted in accordance with AR 200-3, *Natural Resources Land, Forest, and Wildlife Management*; and Technical Manual (TM) 5-631, *Natural Resources Forestry Management*. (U.S. Army Missile Command 1995)

Redstone Arsenal actively participates in programs to reduce and eliminate the use of Ozone-depleting chemicals under U.S. Army Missile Command Policy No. 200-4, Elimination of Ozone-Depleting Substances (U.S. Army Missile Command 1994a).

The ETTD, Building 3449, within the OMMCS Headquarters area, has 3 classrooms which are primarily used for soldering training. Classrooms 1, 2, and 6 are all equipped with Purafil Filtration Systems.

McKinley Range has three demolition areas for the detonation of live ordnance. These are the Peace Talks site, Phase 3 dig site, and the Telecom Loop site. The ordnance that is detonated must be under 5 pounds net explosive weight, but usually no more than 3 pounds net explosive weight is detonated at any one time.

Corkern Range uses an area behind the sand pit for detonating 105mm projectiles. This area is a lowland where the soil is moderately wet throughout the year; however, this area is not considered a wetland.

Building 2575, located on the ASP Site, contains a small block building approximately 12 feet by 12 feet used as a paint booth. The paint booth has three sides and a ceiling. The back wall of the paint booth is covered with a filtering system.

The HDD Range has a sand pit in which explosives are detonated. A maximum of 2.5 pounds net explosive weight of explosives is detonated at one time.

### **3.2 BIOLOGICAL RESOURCES**

**Region of Influence** - The ROI for biological resources are the site-specific locations within the OMMCS facilities located throughout Redstone Arsenal.

**Affected Environment** - This section describes the biological resources of the OMMCS ranges by major biotic habitat. Threatened or endangered species or species with unique habitats are also addressed. Information in this section comes from existing documentation and has not been

completely field verified. Most of the ecological resources of the Arsenal as a whole have not been well documented and no systematic characterization has been performed. A summary table of ecological resources is available in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation* (U.S. Army Missile Command 1994a).

Several Federal agencies oversee various aspects of biological resource management. The Endangered Species Act declares that it is the policy of Congress that all Federal departments and agencies shall seek to conserve threatened and endangered species. Further, the act directs Federal agencies to use their authorities in furtherance of the purposes of the act.

Terrestrial and aquatic resources on the OMMCS ranges include vegetation and wildlife communities in a variety of ecological associations. Wetland resources are located in several OMMCS locations, as described in the following sections. Activities in wetland areas which move or compact soil are no longer an acceptable practice as they reduce the value of the wetlands as a functional biological system (Weber 1996).

Arsenal open land comes in many forms other than agricultural land. Among these are training areas, test areas and ranges, utility right-of-ways, firelanes, logging decks, logging roads, abandoned agricultural fields, parade fields, recreation areas, and even lawns. Many of these areas are periodically mowed under scheduled maintenance during the growing season. Open land provides edge effect and diversity in the plant communities. This diversity provides food (browse, fruit, seed, insects), nesting, and protective cover that may not be available in the forest.

Natural woody vegetation found on the Arsenal includes eastern red cedar, white oak, red oak, cherrybark oak, chestnut oak, black tupelo (black gum), white ash, yellow poplar, red maple, flowering dogwood, elm, birch, beech, walnut, and black locust. Extensive landscape plantings have been made with red maple, silver maple, sugar maple, pin oak, sycamore, ginkgo, thornless honey locust, southern red oak, weeping willow, white ash, and loblolly, shortleaf, Virginia, and white pines. Ornamental trees include eastern redbud, dogwood, saucer magnolia, crepe myrtle, crabapple, and Japanese maple. A wide variety of shrubs and ground cover plants also have been used in landscape plantings. (U.S. Army Missile Command 1994b)

The Arsenal also has willow oak, water oak, chinquapin oak, post oak, blackjack oak, Shumard oak, swamp chestnut oak, northern red oak, and southern red oak, shagbark hickory, mockernut hickory, bitternut hickory, water hickory, pignut hickory, silver maple, boxelder, sugar maple, tulip poplar, cottonwood, American elm, winged elm, slippery elm, swamp dogwood, storax, fringe tree, buttonbush, swamp privet, green hawthorn, parsley hawthorn, dotted hawthorn, swamp azalea, shining sumac, Carolina buckthorn, hop hornbeam, honey locust, and lead plant. (Weber 1996)

Non-woody vegetative cover consists of Bermuda grass, Johnson grass, broomsedge, crab grass, and numerous weed species. Planted species include tall fescue, southern white clover, ladino clover, common lespedeza, sericea lespedeza, and rye grass. (U.S. Army Missile Command 1994b)

Some wildlife species (edge species) benefit from non-forested land in meeting some of their life requirements. Open land provides edge effect and diversity in the plant communities. This diversity provides food (browse, fruit, seed, insects), nesting and protective cover for edge species that may not be available in the forest. Wildlife biologists are now taking a hard look at

what interior species need. Edge benefits edge species and those that feed on them, but not interior forest animals or plants (Weber 1996).

The most common mammals on the Arsenal are white-tailed deer, eastern cottontail rabbit, swamp rabbit, eastern gray squirrel, woodchuck, muskrat, opossum, raccoon, fox, coyote, fox squirrel, and bobcat. Other mammals found on the Arsenal include the white footed mouse, cotton rat, deer mouse, and pine vole (Weber, 1996). Wheeler National Wildlife Refuge (approximately 4,000 acres of which are located on the Arsenal) has over forty known mammal species including those listed above as well as rarer species such as spotted skunk, mink, and the longtail weasel (U.S. Army Missile Command 1994b).

Over 250 bird species are known residents or migrants in the Arsenal area. More than 20 species are considered common year-round. They include the following: mallard, wood duck, rock dove, common crow, great blue heron, red-shouldered hawk, sparrow hawk, screech owl, red-shafted flicker, red-bellied woodpecker, hairy woodpecker, Carolina wren, mockingbird, brown thrasher, starling, eastern meadowlark, red-winged blackbird, common grackle, cardinal, rufous-sided towhee, field sparrow, bluejay, and house sparrow. Other resident birds on the Arsenal include the pileated woodpecker, downy woodpecker, nuthatch, titmouse, bluebird, pine warbler, song sparrow, mourning dove, red-tailed hawk, barred owl, barn owl, great-horned owl, eastern phoebe, killdeer, woodcock, cowbird, and kingfisher (Weber, 1996).

There are over one hundred species of fish in Arsenal area waters (U.S Army Missile Command, 1994a). The Alabama Natural Heritage Program lists 31 species of fish (regarded by them as only a partial listing, since no complete biological inventory was attempted) collected during their inventory of Redstone Arsenal (Alabama Natural Heritage Program, 1995).

The following species with potential to exist on the Arsenal and considered rare or endangered by either state or Federal wildlife authorities include: Alabama cave shrimp, American burying beetle, slackwater darter, Tuscumbia darter, southern cave fish, green salamander, eastern hellbender, Tennessee cave salamander, northern pine snake, alligator snapping turtle, eastern box turtle, American peregrine falcon, bald eagle, Appalachian Bewick's wren, Rafinesque's big-eared bat, gray bat, and Indiana bat. (Alabama Natural Heritage Program, 1995)

**3.2.1 OMMCS Headquarters Area.** The OMMCS Headquarters area is shown in Figure 2-2. Existing buildings that comprise the OMMCS facilities are listed in Table 2-1. Most facilities within the Headquarters area are indoor facilities. There is one outdoor facility within this area, the Technical Escort Training Area.

Vegetation - Vegetation surrounding the OMMCS Headquarters area consist of landscape plantings of native trees, native and ornamental shrubs, and isolated areas of turf grasses. No unusual or atypical vegetative species were observed during site visits to this area.

Fish and Wildlife - Typical passerine avifauna (e.g. American robin, brown thrasher, mockingbird, bluejay) were observed during site visits to the OMMCS Headquarters area. No other wildlife species were observed, or expected, at this site, primarily due to lack of suitable wildlife habitat. No aquatic resources exist to support fish and other aquatic organisms at this site.

Aquatic Resources, Threatened and Endangered Species, Wetlands, and Unique Habitats - None of these resources were observed or are known to exist on the OMMCS Headquarters site. No hydric soils that support wetland areas is known from this site.

**3.2.2 McKinley Range.** McKinley Range is shown in Figure 2-3. The range is approximately 735 acres in size, contains 42 static training sites, and has approximately 26 miles of unimproved roadways. The range has been in operation for over 30 years.

Vegetation - McKinley Range is a site of interconnected low wet woods with numerous shallow pools. The dominant woody vegetation found on McKinley Range includes eastern red cedar, loblolly pine, Virginia Pine, red oak, willow oak, and water oak.

McKinley Range contains several large non-forested areas. Some parts of these non-forested areas are kept closely mowed for mission requirements. Some are included in agricultural leases. Other parts can have more dense vegetation, even thickets, but still require periodic maintenance to keep the areas open, or to keep the vegetation below a certain height. (U.S. Army Missile Command 1994b)

Fish and Wildlife - Due to the size and location of McKinley Range a wide variety of wildlife species can be supported. Ecological habitats ranging from dense wooded areas to large open spaces and from drier upland to wetter bottomland are available and utilized by a variety of wildlife and avifaunal species. Deer, turkey, woodpecker, coyote, skunk, opossum, squirrel, and a variety of song birds are seen or heard by individuals who frequent this area.

Rock Pond, in the northeast corner of the range, and the drainage canal that runs south to north near the center of the range, do support fish and other aquatic organisms that occur commonly in other water bodies across the Arsenal.

Aquatic Resources - Rock Pond, which forms a natural border in the northeast corner of McKinley Range, is approximately 30 acres in size. This body of water supports various species of fish and is utilized for sport fishing by permitted individuals.

Threatened and Endangered Species - An area with the size and suitable habitat niches of McKinley Range has the potential to support several rare species of plants and animals that may be tracked, listed, or of special concern to state and federal authorities. No threatened or endangered species have been reported to exist on McKinley Range. The candidate species dwarf trillium (*Trillium pusillum*) has the potential to exist in wetland areas on McKinley Range.

Wetlands - McKinley Range is composed of level, marshy, karstic land and contains hydric soil (Robertsville silt loam, Table 3-4) which is typical of wetland areas. Approximately sixty percent of the range is considered wetlands. A tupelo swamp is present to the north of Building 8001 ("Snake Pit"). This wetland area is the closest one to impact areas on this range and is environmentally sensitive to sedimentation (Weber, 1996). One major canal runs from south to north along Canal Road through the middle of the range. This canal drains the range of excess water to keep it open and usable for training. There are additional smaller branch canals located on the range to assist in range drainage. These branch canals have been heavily impacted by beaver activity and range drainage has become a problem.

Unique Habitats - Unique and rare habitat types are known to exist on McKinley Range. These include tupelo ponds and overcup oak/buttonbush ponds. Other bottomland is also in the area that is suitable habitat for *Trillium pusillum* and other species that occur in bottomlands (such as Indiana bats). (Weber 1996)

**3.2.3 Corkern Range.** Corkern Range is shown in Figure 2-4. The main range used for training activities (located off of Hansen Road) is approximately 30 acres in size; the overall range is 145 acres. Range roads are unimproved roadways. Corkern Range has an area behind the sand pit used for the detonation of 105mm projectiles that is a lowland where the soil is moderately wet throughout the year; however, this area is not considered a wetland.

Vegetation - The dominant woody vegetation found on Corkern Range includes eastern red cedar, loblolly pine, cherrybark oak, willow oak, red maple, and sweetgum.

Fish and Wildlife - A wide variety of wildlife species could be supported on an area the size of Corkern Range. Ecological habitats ranging from dense wooded areas to large open spaces are available and used by a variety of wildlife and avifaunal species. Deer, turkey, woodpecker, coyote, skunk, opossum, squirrel, and a variety of song birds are seen or heard by individuals who frequent this area.

Aquatic Resources - The northern boundary of the Wheeler National Wildlife Refuge (WNWR) is located on the southern end of Corkern Range.

Threatened and Endangered Species - No threatened or endangered species are known to exist on Corkern Range.

Wetlands - Corkern Range contains areas of hydric soil (Melvin silty clay loam, Table 3-4) which is typical of wetland areas. Characteristic wetland plant species observed in an approximately one to two acre area in the southeast corner of the range include *Cardamine bulbosa* (spring cress), *Juncus effusus*, *Panicum dichotomum*, and *Cyperus* spp.

Unique Habitats - No unique habitats were observed or are known to exist on Corkern Range, although the northern boundary of WNWR is located on the southern end of the range.

### **3.2.4 ASP Site**

**3.2.4.1 ASP Range.** The main ASP Range, shown in Figure 2-5, is located to the west of Rideout Road and north of Overlook Road, in the northwest portion of the Arsenal. The range is approximately 328 acres in area.

Vegetation - The ASP Range consist of large, open, grassed training areas surrounded by a variety of tree species. The predominant trees around the ASP Range site were oaks (water, red, white, and willow) and pines (mostly loblolly).

The ASP Range contains several large non-forested areas. Some parts of these non-forested areas are kept closely mowed for mission requirements. Other parts can have more dense vegetation, even thickets, but still require periodic maintenance to keep the areas open, or to keep the vegetation below a certain height. (U.S. Army Missile Command 1994b)

Fish and Wildlife - A wide variety of wildlife species could be supported on an area the size of the ASP Range. Ecological habitats ranging from dense wooded areas to large open spaces are available and used by a variety of wildlife and avifaunal species. Deer, turkey, woodpecker, coyote, skunk, opossum, squirrel, and a variety of song birds are seen or heard by individuals who frequent this area.

Aquatic Resources and Wetlands - Neither of these resources were observed or are known to exist on this site. No hydric soil, which supports wetland areas, is found on this range.

Threatened and Endangered Species - There is the potential for the federally listed as endangered Alabama cave shrimp (*Palaemonias alabamiae*) to exist in solution caverns beneath the ASP Range. No other threatened or endangered species are known from this area.

Unique Habitats - Solution caverns are known to occur under various locations across the Arsenal including the ASP Range and points south. The Alabama cave shrimp (*Palaemonias alabamiae*), listed as endangered by the Federal government, as well as other sensitive cave species have the potential to occur in any of these solution caverns.

According to Mr. Scott Shaw, former MICOM Staff Archaeologist, twenty-two caves are known to underlie Redstone Arsenal, several of which have not been mapped. Animals found in Arsenal caves include the southeastern bat, gray bat, Tennessee cave salamander, southern cave fish, flame chub, cave crayfish, and Alabama cave shrimp.

Matthews Cave is located in the north-central part of the ASP Range adjacent to and immediately south of Interstate 565. According to *Geologic, Hydrologic, and Biologic Investigations in Arrowwood, Bobcat, Matthews, and Shelta Caves and Selected Caves, Madison County, Alabama* (Rheams *et al.* 1992), the recharge area for Matthews Cave, located on this site, is north of the cave. The recharge area has a roughly elliptical pattern approximately 15 miles long and 5 to 6 miles wide, extending to the north and encompassing approximately 45 square miles. The recharge area for Arrowwood and Bobcat Caves, located 2 to 2.5 miles southwest of Matthews Cave, overlaps the recharge area of Matthews Cave.

Matthews Cave, which is formed in the Tuscumbia Limestone, extends for a distance of approximately 1,752 feet along the eastern edge of a low elongate partially wooded north-south knoll (Rheams *et al.* 1992). The cave crayfish (*Orconectes australis australis*), a rare species in Alabama, and the southern cavefish (*Typhlichthys subterraneus*), a state-protected species, are known from this cave as well as Bobcat Cave, located in the west-central part of the Arsenal. Both caves have connections to significant aquatic systems (Alabama Natural Heritage Program 1995).

Surveys have been conducted to verify the existence of the Alabama cave shrimp in Matthews Cave. The cave seems to offer suitable habitat for the cave shrimp and is suspected to be hydrologically connected to other caves that support populations of this species. To date no cave shrimp have been observed in Matthews Cave. (Rheams *et al.* 1992)

The cave crayfish (*Orconectes australis australis*), a rare species in Alabama, and the southern cavefish (*Typhlichthys subterraneus*), a state-protected species, are known from Matthews Cave, located on the northern boundary of the ASP Range as well as Bobcat Cave, located in the west-central part of the Arsenal. Both caves have connections to significant aquatic systems (Alabama Natural Heritage Program 1995).

**3.2.4.2 ASP FTX Site.** The ASP FTX site (Training Area #3) is a grassy area approximately six acres in size located to the west of the main ASP Range (Figure 2-5). This area is used for field training exercises including overnight exercises.

Vegetation - The ASP FTX Site consist of large, open, grassed training areas surrounded by a variety of tree species. The predominant trees bordering the ASP FTX Site were eastern red cedars, loblolly pines and oaks (mostly water oak).

Plantings within the open spaces of these areas are used primarily for control of dust and soil erosion. Limited irrigation may be required to ensure survival of sprigs and plugs at planting time. Fertilization is limited to seedbeds at planting time for initial establishment and occasional treatments to prevent loss of established planting. Mowing of these areas is required at intervals depending on intensity of use. (U.S. Army Missile Command 1994b)

Fish and Wildlife - A wide variety of wildlife species could be supported in the fringe areas surrounding the ASP FTX Site. Ecological habitats ranging from dense wooded areas to large open spaces are available and used by a variety of wildlife and avifaunal species. Deer, turkey, woodpecker, coyote, skunk, opossum, squirrel, and a variety of song birds are seen or heard by individuals who frequent this area.

Aquatic Resources, Threatened and Endangered Species, Wetlands, and Unique Habitats - None of these resources were observed or are known to exist on the ASP FTX site. See Section 3.2.4.1 for a discussion of Unique Habitats in the overall ASP Range area.

**3.2.5 HDD Range.** The HDD Range is shown in Figure 2-6. The main range (located south of Buxton Road) is approximately 63 acres in size and has a 327 acre exclusion zone (controlled by MICOM) surrounding the range. Range roads are unimproved roadways.

Vegetation - The dominant woody vegetation found on the HDD Range includes white oak, red oak, willow oak, water oak, shagbark hickory, loblolly pine, sweetgum, sycamore, hackberry, wild cherry, green ash, and sumac.

Fish and Wildlife - A wide variety of wildlife species could be supported on the HDD Range. Ecological habitats ranging from dense wooded areas to large open spaces are available and used by a variety of wildlife and avifaunal species. Deer, turkey, woodpecker, coyote, skunk, opossum, squirrel, and a variety of song birds are seen or heard by individuals who frequent this area.

Aquatic Resources, Threatened and Endangered Species, and Unique Habitats - None of these resources were observed or are known to exist on the HDD Range.

Wetlands - The HDD Range contains hydric soils (Melvin silty clay loam and Robertsville silt loam, Table 3-4) which support wetland areas found on this range.

**3.2.6 FTX Site.** The FTX site is shown in Figure 2-7. The FTX site is located off Hansen Road in the northeast portion of Redstone Arsenal. The site covers approximately 1,000 acres and consists of open fields, wetland areas, wooded areas, foxholes, and unimproved roads. The open fields are used to set up wheeled vehicles while tracked vehicles are used in nearby areas.

Vegetation - The dominant woody vegetation found on the FTX site includes sweetgum, cherrybark oak, willow oak, and water oak. A good percentage of the FTX site is open areas for training and field exercises.

Fish and Wildlife - A wide variety of wildlife species could be supported on the FTX Site. Ecological habitats ranging from dense wooded areas to open spaces are available and used by a variety of wildlife and avifaunal species. Deer, turkey, woodpecker, coyote, skunk, opossum, squirrel, and a variety of passerine birds are seen or heard by individuals who frequent this area.

Aquatic Resources, Threatened and Endangered Species, and Unique Habitats - None of these resources were observed or are known to exist on the FTX site.

Wetlands - The FTX site contains hydric soils (Melvin silty clay loam and Robertsville silt loam, Table 3-4) which support wetland areas on this range. Excavation of selected areas is performed during training exercises. This includes digging six inch deep tent pads and six foot deep foxholes. These activities have been performed in the wetland areas in the past, but range personnel indicate that field training activities no longer take place in the wetland areas.

A small, approximately two acre, enclosed depression was observed during site visits to this area. This area was west of the two storage trailers located on the site and east of Patton Road. The area did exhibit hydrologic and vegetative characteristics consistent with wetlands of the PFO1A (Palustrine, Forested, deciduous, temporarily saturated or flooded) type. Species of grasses (*Arudinaria gigantea* and *Chasmanthium laxum*) were observed.

**3.2.7 HAWK Hardstand Site.** The HAWK Hardstand site is shown in Figure 2-7. It consists of approximately 10 acres located off Hansen Road in the northeast portion of Redstone Arsenal. This site has numerous paved areas where HAWK missile batteries are set up for training. Open fields comprise the remainder of the site. No new construction is expected at this site and no ammunition storage points are located at the site.

Vegetation - The Hawk Hardstand Site is an entirely non-forested area. Some parts of these non-forested areas are kept closely mowed for mission requirements. The primary vegetation observed during site visits to this area were herbaceous weeds and grasses in the open fields. The site was enclosed entirely by fencing and no large trees were observed inside the fence line.

Fish and Wildlife - Although suitable wildlife habitat exist on the Hawk Hardstand Site, access is somewhat limited by fencing that surrounds the entire site. This would limit access for some of the larger wildlife species. Additionally, since trees and shrubs are absent from inside the fenced area, habitat for some birds is limited. No habitat for fish is present on this site.

Wetlands - The Hawk Hardstand area contains a pocket of hydric soil (Guthrie silt loam, Table 3-4) that could support wetland areas on the site, although no wetland areas were observed or are known to exist on this site.

Aquatic Resources, Threatened and Endangered Species, and Unique Habitats - None of these resources were observed or are known to exist on the Hawk Hardstand Site.

**3.2.8 Corps Storage Area.** The CSA, shown in Figure 2-8, is located on approximately 400 acres in the southern part of the Arsenal near the Tennessee River. Training in this area occurs in and around the ammunition storage magazines.

Vegetation - The predominant vegetation found in the CSA is eastern red cedar followed by loblolly pine. The Ammunition storage igloos, which are nestled into the forested areas along dirt

roads that lie between the structures, have been established with Bermuda, Sericea (*Lespedeza* spp.) and Kudzu.

*Fish and Wildlife* - A wide variety of wildlife species could be supported in the CSA. Ecological habitats ranging from dense wooded areas to open spaces (dirt roads) are available and used by a variety of wildlife and avifaunal species. Deer, turkey, woodpecker, coyote, skunk, opossum, squirrel, and a variety of passerine birds are seen or heard by individuals who frequent this area.

*Aquatic Resources, Threatened and Endangered Species, Wetlands, and Unique Habitats* - None of these resources were observed or are known to exist on the CSA site. No hydric soils that could support wetland areas are known from this site.

**3.2.9 Confidence Course.** The confidence course (Training Area E-North) in Figure 2-7, is a 10 acre site located off Hansen Road. This area is partially wooded and contains an obstacle course used for student confidence training.

*Vegetation* - A wide variety of tree and shrub species were observed during site visits to this area including: water, cherrybark, red, white, and willow oaks; red buckeye; osage orange; sycamore; hackberry; and Asian privet.

This area also contains several large non-forested areas. Some parts of these non-forested areas are kept closely mowed for mission requirements. Some are included in agricultural leases. Other parts can have more dense vegetation, even thickets, but still require periodic maintenance to keep the areas open or the vegetation below a certain height.

*Fish and Wildlife* - This site offers a range of habitats from dense wooded areas to large open spaces. A variety of fish and wildlife species exist or have the potential to exist on this site. A wide variety of wildlife species could be supported in the fringe areas surrounding the Confidence Course. Ecological habitats ranging from dense wooded areas to large open spaces are used by a variety of wildlife and avifaunal species. Deer, turkey, woodpecker, coyote, skunk, opossum, squirrel, and a variety of song birds are seen or heard by those who frequent this area.

*Aquatic Resources* - A portion of McDonald Creek, a tributary of Huntsville Spring Branch, runs through the western edge of this site. McDonald Creek drains some 6,000 acres in the northeastern portion of the Arsenal and the adjoining land owned by the city of Huntsville.

*Threatened and Endangered Species and Wetlands* - Neither of these resources were observed or are known to exist on this site. No hydric soils that could support wetland areas are known from this site.

*Unique Habitats* - Sensitive habitats that are known to exist near the Confidence Course include springs adjacent to the area (Weber 1996). An unnamed spring, which flows into McDonald Creek, is located near an old homesite located on the range. This spring is an important habitat for species that require clean, clear water flowing over stones (riffle areas), such as certain darter species and stone rollers.

### 3.3 CULTURAL RESOURCES

**Region of Influence** - The ROI is the site-specific locations within the OMMCS facilities.

**Affected Environment** - Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources are divided into three categories: archaeological (prehistoric and historic), historic resources and structures, and traditional (e.g., American Indians or other ethnic groups).

Prehistoric archaeological resources are defined as physical remnants of human activity that predate the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, and other evidence of prehistoric behavior.

Historic resources consist of physical properties or locations postdating the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, documents, and other evidence of human behavior. Historic resources also include locations associated with events that have made a significant contribution to history or that are associated with the lives of historically significant persons.

Traditional native resources may be prehistoric sites and artifacts, historic areas of occupation and events, historic and contemporary sacred areas, materials used to produce implements and sacred objects, hunting and gathering areas, and other botanical, biological, and geological resources of importance to contemporary American Indian groups.

The area now comprising Redstone Arsenal consisted of small, family owned farms prior to acquisition of the land by the government in the early 1940's. Because of this, several small cemeteries are located within the boundaries of the Arsenal. Excavations and construction activities on the Arsenal have yielded a variety of both early settlement artifacts and native American objects.

The earliest recorded archaeological work on what is now Redstone Arsenal was performed in 1915. More extensive and exacting regional excavations took place in the 1930s. An inventory of historical buildings and structures, fully coordinated with SHPO, was conducted for Redstone Arsenal in 1984 (U.S. Army Missile Command, 1994a). Federal compliance studies have been done at the Arsenal since the 1970s and have resulted in the survey of approximately 6,000 acres of the installation for cultural resources (Shaw 1996).

The Arsenal is divided into three topographic or land form zones that possess varying degrees of archaeological potential. Zone 1 is composed of rolling land combined with flat plateaus that have undergone considerable erosion and is considered to have low to moderate archaeological potential. Zone 2 is made up of the flood plains on the Arsenal and is considered to have high archaeological potential. Zone 3 is composed of mountainous land and is considered to have low archaeological potential. (U.S. Army Missile Command, 1994a)

The only designated historical site on Redstone Arsenal currently listed on the National Register of Historical Places is the Redstone Missile Test Stand. This historical site is located on the Marshall Space Flight Center portion of the installation.

The following areas discussed within this assessment do not have any identified historical or cultural resource sites, and activities at these areas have not produced evidence of possible sites: OMMCS Headquarters area, Corkern Range, ASP Range, ASP FTX site, the CSA, and HDD Range. McKinley Range does possess both known and suspected cultural resource sites. Both historic and prehistoric materials have been discovered, and two cemeteries (Simpson and Lynch cemeteries) are located within the boundaries of McKinley Range.

The FTX Site and HAWK Hardstand site do not have any identified historical or cultural resource sites on their training areas, and training activities at these areas also have not produced evidence of possible sites. The Confidence Course does contain two recognized sites – 1Ma279, a prehistoric site, and 1Ma597, a late 19<sup>th</sup> to early 20<sup>th</sup> century site. Phase II archaeological work was performed on both sites in November 1995. Both sites were determined to be not significant and ineligible for listing on the National Register of Historic Places and will be released to OMMCS once the Alabama SHPO concurs with these findings. (Panamerican Consultants, 1996) Six identified cemeteries are also located within an approximate 2,500 foot radius of each of these locations. These cemeteries are not affected by the current training program.

### **3.4 HAZARDOUS MATERIALS AND WASTE**

**Region of Influence** - The ROI for hazardous materials and waste is Redstone Arsenal.

#### **Affected Environment**

**Hazardous Materials** - A variety of regulatory agencies (e.g., EPA, DOT) have promulgated differing definitions of a hazardous material as applied to a specific situation. Of these definitions, the broadest and most applicable is the definition specified by the DOT for regulation of the transportation of these materials. As defined by the DOT, a hazardous material is a substance or material which is capable of posing an unreasonable risk to health, safety, or property when transported in commerce and has been so designated (49 CFR 171.8). Included in this definition are specifically designated hazardous substances which fall into the following broad categories: explosives, oxidizing materials, compressed gasses, poisons, flammable liquids, flammable solids, combustible liquids, organic peroxides, radioactive materials, and other regulated materials.

Several Federal agencies oversee various aspects of hazardous material usage. The DOT regulates the safe packaging and transporting of hazardous materials, as specified in 49 CFR parts 171 through 180 and Part 397. The OSHA regulates the safe use of hazardous materials in the workplace in 29 CFR, primarily Part 1910. Environmental safety and public health issues associated with hazardous materials are regulated by the EPA through specific criteria applied to areas such as air emissions and water discharge.

Material Safety Data Sheets (MSDSs) are maintained on file in all areas containing hazardous materials. Personnel that use, handle and store hazardous materials are trained in HAZCOM 29 CFR 1910.1200 requirements.

Hazardous Materials storage cabinets that comply with OSHA regulations and meet National Fire Protection Association (NFPA) Standard 30 are used to store hazardous materials used within OMMCS training areas. Each cabinet has a two inch leak-proof sill in the base to contain spills. These cabinets are under key and lock control, and only trained personnel have access to them. Inventory forms with cabinet contents and MSDSs are maintained at each cabinet. A copy of the

Installation Spill Control Plan is also maintained at each cabinet and personnel are trained to implement the Plan.

Lead-Based Paint - Lead was used in many paints applied before the early 1980's. It was also used in piping, cable sheaths, batteries, and solder. Lead is regulated in the workplace for exposure to workers although most documented health effects relate to pregnant women and children where exposure has been correlated with birth defects and learning difficulties. There has been a large scale lead abatement program within public buildings over the last few years in the U.S. as a result of these risks. The requirements for workers to follow dust control techniques and respiratory protection normally only become effective when paint containing lead is abraded or the structure is demolished. (The Environmental News 1995) Since the existing OMMCS buildings range in age, some as old as forty to fifty years, it is assumed that the buildings contain lead-based paint. No actual studies have been conducted to document the extent of the presence of lead-based paint in the existing OMMCS buildings.

Asbestos-Containing Materials - Historically, asbestos has been used in literally hundreds of products. Collectively, these products are frequently referred to as asbestos-containing materials (ACM). Asbestos gained widespread use because it is plentiful, readily available, low in cost, and has unique properties. It does not burn, is strong, conducts heat and electricity poorly, and is impervious to chemical corrosion. An asbestos survey of the OMMCS facilities was conducted on February 20, 1996. ACMs have been identified in the following OMMCS buildings: 3209, 3210, 3300-3309, 3315-3323, 3329, 3332, 3340, 3341, 3343, 3344, 3348, 3410, 3412-3413, 3435, 3439-3495, 3534, 3536, 8969, and 8968.

Radon - Radon, a gas produced by the natural process of radioactive decay of radium, constitutes the largest natural radiation exposure to the general public. It is not possible to radon-proof a building, but it is possible to reduce radon levels. Buildings that are in direct contact with the ground will have higher radon levels than buildings with an air space under the dwelling. Radon levels in the upper floors of a multistory building are typically lower than on the ground floor. Radon is constantly escaping from the ground and is always present in the air. Under certain circumstances the concentration of radon in a building can increase significantly over normal outdoor levels. Most buildings have a confined air space with limited air movement and a slow outside air exchange. Normally, indoor radon gas levels can be controlled by natural or forced ventilation. This can range from simply opening windows, to forced ventilation when higher levels need to be abated.

A radon survey has been done on OMMCS buildings (date unknown). Table 3-2 shows the building, room, and reading for the affected areas that are above recommended levels of 4 picocuries per liter.

Hazardous Waste - Waste materials (less commonly referred to as solid waste) are defined in 40 CFR 261.2 as "any discarded material (i.e., abandoned, recycled, or 'inherently waste-like')" that is not specifically excluded. This can include materials that are both solid and liquid (but contained). Hazardous waste is further defined in 40 CFR 261.3 as any solid waste not specifically excluded which meets specific concentrations or has certain toxicity, ignitability, corrosivity, or reactivity characteristics.

**Table 3-2: Radon Survey Results for Affected Areas of OMMCS**

		Reading
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Building	Room/Room number	(pCi/gram)
3305	123	4.1
3315	Mr. Arsenault's Office	4.2
3410	1021	5.3
3433	Maint. Chiller-basement	4.5
3440	107	6.6
3440	110 (Armory room)	6.6
3467	1	4.4
3467	22	4.8
3467	Front Office right	4.2
3467	15	4.3
3470	05	4.8
3641	Back Office	6.3
3641	Elaine's Office	4.8
3708	Lt. Office	5.4
3749	SE corner Jerry Maburs office	5.0

Oversight of hazardous waste issues is provided primarily by the EPA (as mandated by the Resource Conservation and Recovery Act [RCRA] and the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA], and its extension, the Superfund Amendments and Reauthorization Act [SARA]). EPA regulations are found in 40 CFR. Additional requirements are promulgated by the DOT, which regulates all transportation issues pertaining to hazardous waste. DOT requirements are found in 49 CFR.

The EPA defines a "satellite accumulation area" as any area accumulating hazardous waste at or near any point of generation. This definition includes any place where waste chemicals may accumulate pending collection. EPA regulations concerning satellite accumulation areas can be condensed into the following requirements which apply to all satellite accumulation areas (Auburn University, no date).

- Flammable or reactive chemical waste must be protected from any source of ignition (e.g., open flames, cigarette smoking, frictional heat, sparks, radiant heat).
- "No Smoking" signs must be conspicuously posted in any such area.
- Incompatible wastes must not be mixed.
- Wastes must be compatible with their containers. Aqueous waste should not be placed in metal containers. Glass containers offer the greatest range of compatibility.
- Each container must be clearly labeled with the words "Hazardous Waste" or with other words that identify the contents of the containers.
- Waste containers must be sealed except to add or remove waste.
- Waste containers must be inspected weekly for leaks and/or deterioration. If a container is leaking or deteriorating, transfer its contents to a new suitable container.
- No more than 55 gallons of hazardous waste or one quart of any acutely hazardous waste listed in 40 CFR Part 261.33(e) may be accumulated in a satellite accumulation area. A generator who accumulates either hazardous waste or acutely hazardous waste in excess of these amounts must mark the container holding the excess accumulation of hazardous waste with the date the excess amount began accumulating.

Personnel who order, use, handle, store, and dispose (turn-in to DRMO) of hazardous materials or hazardous wastes are required to attend the MICOM Environmental Institute 40-hour,

Hazardous Materials and Hazardous Waste Management course. To date, approximately 150 OMMCS personnel have attended this course. The OMMCS Safety and Environmental Office also conducts First Responder Awareness, HAZCOM, and Environmental Awareness courses.

The OMMCS Missile Systems Training Department has two ADEM approved 90-day permitted storage facilities (Buildings S3327 and S3335). These facilities surpass all EPA, OSHA, and NFPA compliance requirements.

McKinley Range and the training ASP have outdoor hazardous materials and waste vault-style storage cabinets. These weather-proof cabinets store POL products and are accumulation points for generated hazardous waste and non-regulated waste. The cabinets meet NFPA standards, have large spill containment sumps, and surpass EPA 40 CFR requirements.

### **3.4.1 OMMCS Headquarters Area**

Hazardous Materials - Operations within Building 3449, the ETTD, use hazardous materials include gold plating (classroom 1) and lead soldering (classrooms 1, 2, 4, and 6). Oil and hydraulic fluid are also maintained for use in the machine shop (classroom 4). Radioactive sources (e.g., Plutonium, Strontium, and Thorium) are used to calibrate and repair meters in classroom 3. Hazardous materials are stored and/or used in Buildings 3306, 3310, 3314, 3318, S3327, 3328, S3335, 3533, 3534, 3535, 3536, 3539, 3540, and 3541. Hazardous materials with flashpoints less than 141°F are stored inside flammable liquid safety cabinets.

Basic household items are stored inside flammable storage cabinets in the OMMCS troop billeting area (Buildings 3410, 3411, 3412, and 3413). Paint and deicing spray cans are stored inside a flammable storage cabinet in Building 3410. This area is also used for cleaning weapons (pistols and M-16 rifles).

A fenced area topped with concertina wire is located southwest of the main OMMCS Headquarters at the Technical Escort Training Area and is referred to as TS3537/SWMU RSA-47. Historically this area was used as a training area for troops using warfare agents. Live agent training was conducted at this unit from 1972 to December 1985. Live agents were handled inside a plastic-lined concrete sump. A 450-meter radius safety circle surrounded the unit for the containment of escaped gases. Redstone Arsenal decontaminated this unit in 1986 by sampling, analysis, and inspection. The area has been determined to be free of any live warfare agents and is considered suitable for other training use. RSA-47 (excluding the fenced area) is currently used for simulated chemical warfare training. (Geraghty & Miller 1991)

Hazardous Waste - The OMMCS Headquarters area has satellite accumulation areas in Buildings 3306, 3308, S3335, 3533, and 3449 and an oily rag satellite accumulation area in Building 3410.. In some cases these areas do not meet the EPA definition of “satellite accumulation area” because testing has been performed to show the waste is non-regulated (e.g., “waste hydraulic fluid” and “contaminated rags”). EPA regulations concerning satellite accumulation areas were discussed in Section 3.4. OMMCS maintains two ADEM approved, RCRA permitted, 90-day storage facilities (Buildings S3327 and S3335). These buildings are located in the Headquarters/school campus area and are maintained in accordance with 40 CFR 261-262.

### **3.4.2 McKinley Range**

Hazardous Materials - Hazardous materials (e.g., spray paint, WD-40, hornet spray, engine oil, propane fuel bottles, etc.) are stored and/or used in Building 8002 and inside storage areas (2 cabinets) within the motor park area on McKinley Range. Hazardous materials with flashpoints less than 141° F are stored inside flammable liquid safety cabinets. These materials include engine oil, grease, propane fuel bottles, gasoline, and other flammable items.

Hazardous Waste - McKinley Range has satellite accumulation areas in Building 8002 and within the motor park area. These areas do not meet the EPA definition of “satellite accumulation area” because testing has been performed to show the waste is non-regulated (e.g., oily rags). The propane fuel cylinders used on this range are one-time use/non-refillable/disposable type cylinders. Cylinders are used on gas-fired equipment and operated until the cylinder is completely spent. Once spent, the plastic plug on the cylinder is removed and the cylinder is disposed of as “regular municipal trash (waste).”

### **3.4.3 Corkern Range**

Hazardous Materials - Hazardous Materials at Corkern Range include explosives used for training personnel in the handling and disposal of unserviceable ammunition in the field or battlefield through burning/detonation and miscellaneous materials stored in Building 5392 (inventory includes paint, insecticide, and wasp and hornet spray). Explosives used on the range include 105 mm cartridges without fuzes, M6 ignitors, fuzes, detonation cords, electric/non-electric blasting caps, .25 pound TNT blocks, 1.25 pound Composition C-4, and smoke grenades.

Hazardous Waste - For the most part explosive materials are consumed in the demolition process. Expended time fuzes are turned in to DRMO. Soil samples have been collected from the demolition area and analyzed for metal and volatile organic content using the EPA Toxicity Characteristic Leaching Procedure (TCLP). No volatile organic material was found to be above the detection limit and metal content was within acceptable limits.

### **3.4.4 ASP Site**

#### **3.4.4.1 ASP Range**

Hazardous Materials - Hazardous materials (e.g., spray paint) are stored and/or used in Building 2575. Lithium batteries are stored in an unnumbered storage building east of B2592.

Hazardous Waste - Building 2575 has a “central” accumulation point where a 55 gallon drum is kept for used paint filters from a dry type spray booth. OSHA regulations require all discarded filter pads to be immediately removed to a safe, well-detached location or placed in a water-filled metal container and disposed of at the close of the day’s operation unless maintained completely in water.

#### **3.4.4.2 ASP FTX Site**

Hazardous Materials - Hazardous materials are not used or stored at the ASP FTX site.

Hazardous Waste - Hazardous waste is not collected or stored at the ASP FTX site.

### 3.4.5 HDD Range

Hazardous Materials - Hazardous materials at the HDD Range include explosives (e.g., Composition C4, non-electric blasting caps, time fuzes, etc.) used for training activities of civilian law enforcement personnel. There are also hazardous materials used and/or stored in Building 8969 (e.g., insecticide).

Portable X-ray units are used for producing radiographs of suspected explosive devices. The X-ray units are made by Golden Engineering, Inc. The model of the unit is called “The Inspector X-Ray Source Model 200.”

Hazardous Waste - OMMCS has a satellite accumulation area in Building 8969 that contains empty bug repellent spray cans, oily rags, and empty spray paint cans. EPA regulations concerning satellite accumulation areas were discussed in Section 3.4.

Lead-Based Paint - Building 8976A, located approximately 50 feet from Building 8976, has an inside lead-based paint coating which has been identified, is peeling, and is targeted for removal.

Explosives - The metal parts are removed from explosive materials prior to detonation and all explosive material and plastic coating is assumed to be consumed in the demolition process. Explosives used at the HDD Range are similar to those used on the Corkern Range. Soil samples have been collected from the demolition area on Corkern Range and analyzed for metal and volatile organic content using the EPA TCLP. No volatile organic material was found to be above the detection limit and metal content was within acceptable limits. Therefore, the same is expected of explosive materials on the HDD Range.

### 3.4.6 FTX Site

Hazardous Materials - Hazardous materials (e.g., lithium batteries and propane) are used and/or stored in Building 3755 on the FTX Site. Lithium batteries are stored inside an approved Flammable Storage Cabinet in Building 3755, G-1. Propane fuel cylinders are stored inside an approved Flammable Storage Cabinet in Building 3755, G-3.

Hazardous Waste - Hazardous waste is not collected or stored at the FTX Site. Depleted Lithium batteries are removed from the FTX Site, placed inside an approved Flammable Storage Cabinet until limited quantities are accumulated, and turned into DRMO for disposal. The propane fuel cylinders used on this range are one-time use/non-refillable/disposable type cylinders. Cylinders are used on gas-fired equipment and operated until the cylinder is completely spent. Once spent, the plastic plug on the cylinder is removed and the cylinder disposed of as “regular municipal trash (waste).”

### **3.4.7 HAWK Hardstand Site**

Hazardous Materials - Hazardous materials (e.g., paint, hydraulic fluid, cleaning supplies, etc.) are used and/or stored in Building 3760.

Hazardous Waste - Hazardous waste is not collected or stored at the HAWK Hardstand Site.

### **3.4.8 Corps Storage Area**

Hazardous Materials - Hazardous materials are not used or stored at the CSA.

Hazardous Waste - Hazardous waste is not collected or stored at the CSA.

### **3.4.9 Confidence Course**

Hazardous Materials - Hazardous materials are not used or stored at the Confidence Course area.

Hazardous Waste - Hazardous waste is not collected or stored at the Confidence Course area.

## **3.5 HEALTH AND SAFETY**

**Region of Influence** - The ROI for health and safety is Redstone Arsenal.

**Affected Environment** - Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect one or more of the following.

- The well-being, safety, or health of workers - Workers are considered to be persons directly involved with the operation producing the effect or who are physically present at the operational site.
- The well-being, safety, or health of members of the public - Members of the public are considered to be persons not physically present at the location of the operation, including workers at nearby locations who are not involved in the operation and the off-installation population.

The standards applicable to the evaluation of health and safety effects differ for workers and the public; thus, it is useful to consider each separately.

The OSHA is responsible for protecting worker health and safety in non-military workplaces. OSHA regulations are found in 29 CFR. For Army operations, AR 385-10, *Safety*, provides policy on Army Safety Management Procedures.

Protection of public health and safety is an EPA responsibility (mandated through a variety of laws - e.g., RCRA, CERCLA/SARA, and the CAA). EPA regulations are found in 40 CFR. Additional safety responsibilities are placed on the DOT (for transportation issues [49 CFR]), the DOD, and the Department of the Army (program requirements established in AR 385-10).

Physical hazards associated with explosives training include lightning, static electricity, induced currents, and blast effects. Each of these is discussed below:

- **Lightning:** Explosives can be initiated by a lightning strike or nearby miss. If lightning strikes occur, even far away from the blasting site, electrical firing circuits could be initiated by high, local earth currents and shock waves resulting from the strikes. These effects are increased when lightning strikes occur near conducting elements, such as fences, railroads, bridges, streams, underground cables or conduits, and in or near buildings. The only safe procedure is to suspend all blasting activities during electrical storms or when an electrical storm is imminent.
- **Static Electricity:** Extreme caution should be exercised when working with explosives (in particular blasting caps) in cold, dry climates or when wearing clothing and equipment that produce static electricity. In situations where static electricity is a problem, personnel should be instructed to remove the static electricity from their body by touching the earth or a grounded object. This grounding procedure may have to be repeated frequently in an area where static electricity is a constant problem.
- **Induced Currents:** Radio signals can induce a current in explosives and prematurely detonate them. The Army has established minimum safe distances from transmitters for safe electrical blasting (Table 3-3). This table applies to operating radio, radar, microwave, and television transmitting equipment. Mobile transmitters and portable transmitters should be located at least 50 meters from any electric blasting cap or electrical firing system. Electric blasting caps should not be used within 155 meters of energized power transmission lines.
- **Blast Effects:** Personnel in close proximity to explosions may experience permanent hearing loss or other injury from the pressure wave caused by an explosion. OMMCS personnel wear hearing protection during all blasting operations. Personnel observing minimum safe distances for bare charges (See Table 3-3 and AR 385-63) generally will not be affected by blast effects.

**Table 3-3: Safe Distances for Blasting Near Radio Frequency Energy**

Average or Peak Transmitter Power (Watts*)	Minimum Safe Distance (Meters)
0 to 29	30
30 to 49	50
0 to 99	110
100 to 249	160
250 to 499	230
500 to 999	305
1,000 to 2,999	480
3,000 to 4,999	610
5,000 to 19,999	915
20,000 to 49,999	1,530
50,000 to 100,000	3,050

\*When the transmission is a pulsed- or pulsed, continuous-wave type and its pulse width is less than 10 microseconds, the left-hand column indicates average power. For all other transmitters, including those with pulse widths greater than 10 microseconds, the left-hand column indicates peak power.

**3.5.1 OMMCS Headquarters Area.** Health and safety concerns at the OMMCS Headquarters area involve the safe use and storage of hazardous materials at buildings 3306, 3310, 3314, 3318, S3327, 3328, 3533, 3534, S3535, 3536, 3539, 3540, and 3541, as well as potential radiation exposure in building 3449. MSDSs are maintained for hazardous materials, and chemical inventories are readily available. Hazardous materials with flashpoints less than 141° F are stored inside flammable liquid safety cabinets. All personnel are trained per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Personnel involved in the calibration and repair of meters involving radioactive sources participate in a three week Radiation Protection Course and are required to wear radiation film badges that are read/processed monthly. All readings to date have been below background levels (Cranford 1996). The radiation dosimetry program is supplemented with periodic radiation surveys to ensure radiation exposure is within acceptable limits. A “radioactive material” sign is posted on the door of classroom 3 in Building 3449 to warn unauthorized personnel of the potential radiation hazard.

**3.5.2 McKinley Range.** Health and safety concerns at McKinley Range involve the safe use and storage of hazardous materials at Building 8002 and within the motor park area. MSDSs are maintained for hazardous materials, and chemical inventories are readily available. All personnel are trained per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**3.5.3 Corkern Range.** Health and safety issues at the Corkern Range are related to the safe use of explosive materials. Most military explosives are poisonous if ingested and will produce lethal gases if detonated in confined areas such as tunnels, caves, bunkers, and buildings. For this reason sufficient time should be allowed for blast fumes, dust, and mists to clear before inspecting or occupying a blasting area. TNT is extremely poisonous and should not be used to blast in enclosed areas where suitable alternatives are available. Composition 4 is a composite explosive containing 91 percent RDX and 9 percent non-explosive plasticizers and is slightly toxic. The inhalation potential from all explosive materials is minimized at Corkern Range by conducting all demolition activities outdoors.

Explosives are detonated with time blasting fuzes, detonating cord, and/or blasting caps (electric and non-electric). To minimize the ingestion potential, personnel are instructed to avoid touching sensitive areas of the body when working with these materials and to wash their hands after working with explosives, especially before consuming food. (Department of the Army 1992) MSDSs are maintained for hazardous materials, and chemical inventories are readily available. All personnel are trained per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

#### **3.5.4 ASP Site**

**3.5.4.1 ASP Range.** Health and safety concerns at the ASP Range involve the safe use and storage of hazardous materials at Building 2575 and an unnumbered storage building east of Building 2592. MSDSs are maintained for hazardous materials and chemical inventories are readily available. All personnel are trained per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**3.5.4.2 ASP FTX Site.** Hazardous materials are not used or stored at the ASP FTX Site, so there are no special health and safety concerns on this site.

**3.5.5 HDD Range.** HDD Range Health and safety issues relate to the safe use of explosive materials. More information regarding the safe use of explosives is located in Section 3.5.3

Lead vests are made readily available for the use of the portable x-ray machines. A Radioactive Materials sign is posted outside the main building on this range. The sign is there because of the x-ray equipment that is used. MSDSs are maintained for these hazardous materials, and chemical inventories are readily available. All personnel are trained per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

During dry periods, when operations are suspected to have a high fire potential, the Fire Department stands by on the range. No explosive material is stored on the range overnight, at any time.

**3.5.6 FTX Site.** Health and safety concerns at the FTX Site involve the safe use and storage of hazardous materials at building 3755. MSDSs are maintained for the hazardous materials present including lithium batteries and propane fuel tanks. Chemical inventories are made readily available. All personnel are trained per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**3.5.7 HAWK Hardstand Site.** Health and safety concerns at the HAWK Hardstand Site involve the safe use and storage of hazardous materials at Building 3760. MSDSs are maintained for hazardous materials and chemical inventories are readily available. Personnel are trained per OSHA Hazard Communication Standard (29 CFR 1910.1200).

**3.5.8 Corps Storage Area.** Hazardous materials are not used or stored at the CSA, so there are no special health and safety concerns on this site.

**3.5.9 Confidence Course.** Hazardous materials are not used or stored at the Confidence Course area, so there are no special health and safety concerns on this site.

## **3.6 INFRASTRUCTURE AND TRANSPORTATION**

**Region of Influence** - The ROI for infrastructure and transportation is Redstone Arsenal.

**Affected Environment** - Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, and the collection and disposal of solid waste. Transportation addresses the modes of transportation (road, air, rail, marine) that provide circulation within and access to the installation. For this EA, only surface road access will be discussed under transportation. There are no predominant rail or marine facilities at the Arsenal. The airport on the Arsenal is not extensively used as a transportation center.

**3.6.1 Power.** Electrical service to Redstone Arsenal is supplied by the Tennessee Valley Authority. A 155 megavolts absolute (MVA) electrical supply is available to the Arsenal. The average daily electrical use is approximately 55 to 60 MVA with a peak demand of approximately 80 MVA. There are three primary electrical substations on the Arsenal. (U.S. Army Missile Command 1994a)

Natural gas is provided to the Arsenal by North Alabama Gas and obtained through Huntsville Utilities. Natural gas is used for heating in the family housing areas and is the primary fuel for boilers and heating plants in the most accessible areas of the Arsenal. An uninterruptible supply

is metered to the family housing areas and an interruptible supply is metered to the rest of the Arsenal. (U.S. Army Missile Command 1994a)

No. 2 fuel oil is used in the small boilers and heating plants in isolated areas of the Arsenal. This fuel is obtained from local suppliers and is stored in 42 underground storage tanks at various locations on the installation. The Arsenal also uses steam for heating and other activities throughout the Arsenal. The primary source of steam is the Waste-to-Energy plant owned and operated by the Huntsville Solid Waste Disposal Authority. Remote parts of the Arsenal obtain heat from 42 small steam heating plants. (U.S. Army Missile Command 1994a)

Electricity is supplied to OMMCS facilities through the Arsenal electrical system discussed above. The FTX Site (except for Building 3755-G1) and Confidence Course areas do not have a requirement for electricity. No natural gas is used as part of OMMCS training activities or in the facilities.

**3.6.2 Water.** Redstone Arsenal obtains the majority of its water supply from the Tennessee River. Potable water is supplied from two water treatment plants located on the Arsenal (Water Treatment Plants No. 1 and No. 3). The primary industrial water source is Water Treatment Plant No. 1 that obtains raw water from the Tennessee River. Water Treatment Plant No. 3 produces potable water from industrial water. Water Treatment Plant No. 2 provides an auxiliary industrial water supply source and is generally inactive. It is available in case the pumps at Water Treatment Plant No. 1 are shut down for repairs or emergencies. (U.S. Army Missile Command 1994a)

Non-potable wells are located in two areas of the Arsenal: the Visitors Control Building (Building 5105) and Test Area 3. These wells are not used as a drinking water supply, but are used to supply rest rooms and for other purposes such as maintenance, floor washdowns, and livestock watering. Bottled potable water is supplied for use at these sites. (U.S. Army Missile Command 1994a)

New permits for Water Treatment Plants No. 1 and No. 3 have been issued. The treatment plants are regulated under Permit No. 93-532 PWSID0000899, which is applicable until December 31, 1998. (U.S. Army Missile Command 1994a)

Water for wastewater purposes is supplied through the base water system to the OMMCS headquarters area, McKinley Range, Corkern Range, HDD Range, and HAWK Hardstand Site. Water for drinking purposes at the OMMCS headquarters area, McKinley Range, HDD Range, and HAWK Hardstand Site is also supplied through the base water system. There is no need for water for drinking purposes at the Confidence Course and FTX Site. There is no water for wastewater purposes at the CSA, Confidence Course, and FTX Site. Bottled water is used for drinking water at the Corkern Range and the CSA. Water for both drinking and wastewater purposes at the ASP Range is supplied by Huntsville Utilities via a separate water line that comes in from the north side of the Arsenal and has a separate billing system from that of the main Arsenal.

**3.6.3 Wastewater Treatment.** There are three connected wastewater systems with three primary wastewater pumping stations located on Redstone Arsenal. These three stations pump raw sewage to the new centralized wastewater treatment plant also located on the Arsenal. Permit Number AL0062863 has been issued for the new water treatment plant regarding effluent

discharge into the Tennessee River and is applicable until September 29, 1997. (U.S. Army Missile Command 1994a)

Overall wastewater and solid waste discharges at Redstone Arsenal are regulated under National Pollutant Discharge Elimination System (NPDES) Permit Number AL0000019 that is valid through April 1998. This permit specifies discharge limitations and monitoring requirements for wastewater outfall points on the Arsenal. (U.S. Army Missile Command 1994a)

Wastewater is collected by 52 miles of sewers. All sewers 8 inches or larger were upgraded in 1988. A study is in progress to investigate the infiltration/inflow of water into manholes and sewers in the Wastewater Pumping Station No. 4 area. (U.S. Army Missile Command 1994a)

Storm water drainage is also conveyed to the Tennessee River through the Arsenal via McDonald Creek, Huntsville Spring Branch, and Indian Creek. The southern portion of the Arsenal drains directly into the Tennessee River. (U.S. Army Missile Command 1994a)

The Arsenal sewage lines and wastewater treatment system are used at the OMMCS headquarters area and at McKinley Range. Sanitary sewer systems are in place at Corkern Range, ASP Range, HDD Range, and HAWK Hardstand Site. Portable toilets are in use at the CSA and FTX Site, so there is no wastewater treatment requirement at these locations. There are no toilet facilities at the Confidence Course, and therefore no wastewater treatment requirement at this location.

**3.6.4 Solid Waste.** Redstone Arsenal operates a 70-acre permitted landfill for the disposal of inert material consisting of rocks, concrete construction materials, asphalt, and construction debris including tree stumps and asbestos. At the current rate of use, the site's capacity would be sufficient for another 15 to 25 years. The landfill has operated under a contingency permit from the Alabama Department of Environmental Management since Permit Number 45-03R expired on April 30, 1992. (U.S. Army Missile Command 1994a)

All trash and garbage generated on the Arsenal is hauled off-post and disposed of by numerous contractors. The majority of the waste is taken to the Huntsville Solid Waste Authority Waste-to-Energy Plant that opened in 1990 adjacent to the Arsenal (U.S. Army Missile Command 1994a). Dumpsters are in place throughout the OMMCS facilities for basic solid waste disposal use.

**3.6.5 Transportation.** Redstone Arsenal has a well-developed roadway network that allows easy access to various off-installation destinations in three directions (the Tennessee River forms the southern border of the Arsenal preventing roadway access in that direction). The major links in the network carry traffic to and from the Arsenal and serve as major arterials for traffic movement through the area.

The major north-south roads on the Arsenal are Rideout, Patton, and Toftoy roads. The major east-west roads are Goss, Martin, and Redstone Roads. All of these major roads have paved, all-weather surfaces and are in good condition. Heavy traffic flow during morning and afternoon peak travel times on Redstone Arsenal is common. (U.S. Army Missile Command 1994a) Roads in the vicinity of the OMMCS headquarters area, and those leading to the other OMMCS areas, are paved. Roads within the other OMMCS locations are unimproved.

### 3.7 LAND USE

**Region of Influence** - The ROI for land use is Redstone Arsenal.

**Affected Environment** - Redstone Arsenal prepared a Land Use Plan that is part of the 1989-1994 Installation Master Plan. The Land Use Plan promotes cost effective and efficient use of available land, assists in planning for future growth and development, and promotes compatible and coordinated uses of land. (U.S. Army Missile Command 1994a)

**3.7.1 OMMCS Headquarters Area.** The OMMCS Headquarters area is shown in Figure 2-2. Existing buildings that comprise the OMMCS facilities are listed in Table 2-1. Most facilities within the Headquarters area are indoor facilities. There is one outdoor facility within this area (the Technical Escort Training Area). There are no wetlands in this area and roads within this area are paved. No new construction is expected within this area as part of the proposed action.

At the Technical Escort Training Area, there is a fenced area (numbered TS3537) that is an old exclusion area from previous activities at the site. It is also a SWMU identified as RSA-47 (Geraghty and Miller 1991)

**3.7.2 McKinley Range.** McKinley Range is shown in Figure 2-3. The range is approximately 735 acres in size, contains 42 static training sites, and has approximately 26 miles of unimproved roadways. Major McKinley Range training sites are listed in Table 2-2. Most training sites contain “mock-up” facilities and equipment to simulate situations the student may encounter during their follow-on assignments. Equipment mock-ups are mostly static displays.

The range is not used for the destruction of ammunition or explosive ordnance disposal. It is used to conduct demolition training. Demolition training sites for live ordnance are located in three areas: the Peace Talks site, Phase 3 dig site, and the Telecom Loop site. There is a limit of five pounds net explosive weight for any explosive used on the range.

Sixty percent of the range is considered wetlands. One major canal runs from south to north along Canal Road through the middle of the range. There are additional smaller branch canals located on the range. Two cemeteries are located on the range including Simpson Cemetery (a fenced area without headstones) in the northwest portion of the range and Lynch Cemetery (a fenced area with one headstone) located near Building 8001.

**3.7.3 Corkern Range.** Corkern Range is shown in Figure 2-4. The main range used for training activities is approximately 30 acres in size; the overall range is 145 acres. Range roads are unimproved roadways. The Corkern Range contains a sand-filled demolition line used for the demolition of TNT. Five small, concrete block enclosed, demolition points (no longer used) are located approximately 100 feet from the sand line. Nearby are two small man-made ponds that were previously used for underwater demolition training. An area at the rear of the range is used to detonate 105mm cartridges buried in the ground. Corkern Range includes wetland areas. No new construction is expected on the range and no ammunition storage points are present.

### **3.7.4 ASP Site**

**3.7.4.1 ASP Range.** The main ASP Range is shown in Figure 2-5. The range is approximately 328 acres. Several training areas are located throughout the range. A fenced motor park containing up to 60 pieces of equipment (including generators) is also located on the range.

**3.7.4.2 ASP FTX Site.** The ASP FTX site (Training Area #3) is shown in Figure 2-5. It is a grassy area approximately six acres in size located to the west of the main ASP Range.

**3.7.5 HDD Range.** The HDD Range is shown in Figure 2-6. The main range is approximately 63 acres in size and has a 327 acre exclusion zone surrounding the range. Range roads are unimproved roadways. Major training sites for the HDD Range are listed in Table 2-4. The HDD Range contains eight static training sites, nine firing points, disrupter pits, and a sand-filled demolition line.

The HDD Range includes palustrine forested wetland areas and sloughs. These wetland areas are the result of spring runs that have been, in part, blocked by beaver dams. Only when water on Wheeler Reservoir is high does it affect this area. No bulk petroleum products are stored at the range and no new construction is expected on the range.

**3.7.6 FTX Site.** The FTX site is shown in Figure 2-7. The site is used to conduct CTT that includes foot patrols, simulated chemical/biological/radiation attacks (using smoke grenades), and squad tactics. The FTX site covers approximately 1,000 acres and consists of wetland areas, open fields, wooded areas, foxholes, and unimproved roads. The open fields are used to set up wheeled vehicles, while tracked vehicles are used in nearby areas.

The FTX site includes wetland areas. No field training exercises are currently performed in any wetland areas on the range.

**3.7.7 HAWK Hardstand Site.** The HAWK Hardstand site is shown in Figure 2-7. It consists of approximately 10 acres located off Hansen Road in the northeast portion of Redstone Arsenal. This site has numerous paved areas where HAWK missile batteries have been set up for training. Open fields comprise the remainder of the site. No new construction is expected at this site and no ammunition storage points are located at the site.

**3.7.8 Corps Storage Area.** The CSA is shown in Figure 2-8. There are 15 magazines controlled by OMMCS, but they generally use only 4 of them for forklift training. No live ordnance is stored in these magazines.

**3.7.9 Confidence Course.** The confidence course (Training Area E-North) is shown in Figure 2-7. This is a 10-acre site located off Hansen Road that is partially wooded and contains an obstacle course for student confidence training. No tactical vehicles or buildings are on this site.

## **3.8 NOISE**

**Region of Influence -** The ROI for noise is Redstone Arsenal and surrounding area.

**Affected Environment -** Redstone Arsenal has developed an Installation Compatible Use Zone (ICUZ) Program to identify noise generating areas on the Arsenal and to minimize encroachment of noise sensitive activities both on and off the Arsenal. It is not intended to inhibit operations

but to inform community officials of the expected noise generation from mission-related activities. Army facility planners work with the community governments and planning agencies to promote adequate buffer zones between the installation's noise sources and the noise-sensitive areas. (U.S. Army Missile Command 1994a) The ICUZ methodology has been employed to identify the magnitude of the environmental impact of the noise from the tenants using Redstone Arsenal property. Noise complaints are collected, processed, investigated, explained, and reported. The lessons learned are applied to the Arsenal's continuing test and training activities. Noise complaints, even inside the Arsenal boundary, have historically been at a minimal level. (U.S. Army Missile Command 1993)

Redstone Arsenal's principal sources of noise are rocket motor flight test and static firings, warhead detonations/impacts, gun firings, demolition, and airfield operations. Noise producing activities are located such that a significant buffer zone exists between noise producing activities and the nearest population centers. The largest population densities adjacent to the Arsenal are in Huntsville on the north and east boundaries. (U.S. Army Missile Command 1994a)

The City of Huntsville has adopted Noise Ordinance 88-663 that regulates noise production by various sources and defines levels of ambient noise for several types of land use. Figure 3-1 presents comparative sound levels for a variety of common sources. City ordinances cannot be enforced outside of city limits; therefore, the city noise ordinance does not apply to Redstone Arsenal. (U.S. Army Missile Command 1994a)

Portions of the OMMCS facilities conduct training exercises that produce noise through detonation of explosives. These include McKinley Range, Corkern Range, and HDD Range. Other locations (ASP site, FTX site, Headquarters area, CSA, HAWK Hardstand site, and the confidence course) conduct training that produces noise within classroom and/or hands-on training as well as through the movement of personnel in vehicles (e.g., cars, trucks, forklifts).

Demolition training sites on McKinley Range involve live ordnance located in three areas: the Peace Talks site, Phase 3 dig site, and the Telecom Loop site. There is a limit of five pounds net explosive weight for any explosive used on McKinley Range. The Corkern Range contains a sand-filled demolition line used for the demolition of TNT. There are usually less than three pounds net explosive weight of explosives used during training activities. An area at the rear of the range is used to detonate 105mm cartridges buried four feet in the ground. The HDD Range also contains a sand-filled demolition line. There is a limit of 2.5 pounds net explosive weight for any explosive used on the HDD Range. Disrupters (shotguns) are also used on the HDD Range for firing into above ground crosstie pits. These three ranges also conduct training that produces noise within classroom and additional hands-on training areas as well as through the movement of personnel in vehicles.

Personnel working in noise areas are required by regulations/procedures to use ear muffs, earplugs, helmets, or combinations depending on the severity of the noise environment (U.S. Army Missile Command 1993). Ear muffs and foam rubber earplugs are used in certain sites within the OMMCS headquarters area buildings during training activities. Personnel at McKinley Range use ear muffs and foam rubber earplugs during those training activities that use live explosives. During other training activities on the range (i.e., forklift operations) personnel use either method of hearing protection. Personnel on Corkern Range use ear muffs and foam rubber earplugs for protection during explosives training activities. They also use the Corkern

**Figure 3-1: Comparative Sound Levels**

Range bunker for additional protection when training includes the detonation of 105mm shells. Ear muffs are used at the ASP Range within Building 2575. This building has a paint booth within it that generates noise during painting operations. At the HDD Range, personnel use both ear muffs and rubber earplugs during demolition training. During other training activities (i.e., forklift operations) personnel have the choice of either method of hearing protection. The HDD Range has a bunker that can be used for additional protection, but it is unavailable at present for use due to peeling lead-based paint on the bunker's ceiling. It is anticipated that the current bunker will be replaced with a concrete bunker. Foam rubber earplugs are used at the FTX site during some training activities and when generators are in use. Ear muffs and foam rubber earplugs are used at the HAWK Hardstand site when the radar and generators are in operation. Noise levels at the CSA require equipment operators and ground guides to wear muffs or foam ear plugs anytime tactical vehicles or MHE are in operation. Hearing protection is not required at the Confidence Course.

### 3.9 GEOLOGY AND SOILS

**Region of Influence** - The ROI for geology and soils is Redstone Arsenal.

**Affected Environment** - The land surface in the ROI is mantled with a layer of unconsolidated clay and gravel (regolith) that includes flood plain deposits, material that has moved down slope under the influence of gravity and material derived from the chemical decomposition or mechanical weathering of the rocks (Rheams *et al.* 1992). These unconsolidated sediments (regolith) consist mainly of sandy clay, chert and limestone fragments in a clay matrix. Regolith thickness over bedrock in the ROI varies, but generally ranges from 20 to 130 feet in the northern portion of the Arsenal and is generally less than 20 feet in the southern portion (Rheams *et al.* 1992).

Madison County and the ROI are predominantly underlain by thick sequences of carbonate rocks, which generally dip to the south at approximately 20 feet per mile. During geologic periods of time in which this area was inundated by seas, sediments were deposited and later consolidated to form the carbonate rock sequences. Bedrock formations in this area range in age from Ordovician to Pennsylvanian (Lamoreaux 1989). The formations underlying the ROI are composed primarily of limestone with lesser amounts of sandstone, shale, and chert.

Underlying the mantle of regolith in the central and northern portions of Redstone Arsenal are Tuscumbia Limestone and Fort Payne Chert. These units collectively attain a thickness of approximately 300 feet (Rheams *et al.* 1992). The Tuscumbia Limestone and Fort Payne Chert are composed of light gray to white, partly crystalline, highly fossiliferous limestone with interbedded layers and nodules of chert. Underlying the Tuscumbia limestone and Fort Payne Chert is the Chattanooga Shale which is approximately 12 feet thick. The Chattanooga Shale is characterized by light to dark gray shale containing thin bands of pyrite and limestone.

Underlying the mantle of regolith in the southern portion of the Arsenal is the Monteagle Limestone of Upper Mississippian age. The Monteagle Limestone is composed of a sequence of light gray cross-bedded massive to thin-bedded oolitic limestone with interbedded dolostone and dolomitic limestone. The lower beds of the formation are characterized by light-gray cross-bedded oolitic limestone, which distinguished the Monteagle from the underlying Tuscumbia Limestone (Malmberg and Downing 1957). Stratigraphically underlying the Monteagle Limestone are the Tuscumbia Limestone and the Fort Payne Chert (discussed above).

There are numerous hydric soils in the area of Redstone Arsenal. Hydric soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. Hydric soils in Madison County, and potentially on Redstone Arsenal, include: Dowellton, Dunning, Guthrie, Lee (three types), Lobelville (two types), Melvin, Ooltewah (two types), Prader, and Robertsville. The largest acreage of hydric soils on RSA are in Robertsville Silt Loam, associated with stream terraces, and Melvin Silty Clay Loam. These soils can be found on and around many of the OMMCS ranges, and are common indicators of wetland areas on a site. Table 3-4 shows the soil types located on or near selected OMMCS Ranges.

**Table 3-4 Soil Types Located on OMMCS Ranges\* at Redstone Arsenal**

<b>Soil Types (Hydric soils in bold)</b>	<b>CSA</b>	<b>McKinley Range</b>	<b>HDD</b>	<b>ASP</b>	<b>Hawk Hardstand</b>	<b>FTX</b>	<b>Corkern Range</b>
Allen fine sandy loam	X		X				
Allen clay loam	X		X				
Abernathy fine sandy loam	X	X		X			
Abernathy silt loam				X	X	X	
Captina and Capshaw silt loams		X	X			X	X
Cumberland loam		X					
Decatur and Cumberland silty clays	X			X		X	
Decatur and Cumberland silt loams				X	X		
Dewey cherty silty clay				X			
Decatur and Cumberland silty clay loams				X	X	X	
Etowah silt loam			X			X	X
Etowah silty clay loam		X	X			X	X
<b>Guthrie silt loam</b>					X		
Lindside silty clay loam			X				
<b>Melvin silty clay loam</b>			X			X	X
Monogahela fine sandy loam							X
<b>Ooltewah silt loam</b>		X	X				
Pearman loam			X				
Rockland, limestone, hilly				X			
<b>Robertsville silt loam</b>		X	X			X	
Sequatchie fine sandy loam		X					
Tupelo silt loam			X				X
Wolftever silt loam		X	X				

Source: Extracted from **Soil Survey of Madison County**, USDA Soil Conservation Service. In cooperation with Alabama Department of Agriculture and Industries, Alabama Agricultural Experiment Station, and Tennessee Valley Authority. Series 1947, No. 3. Issued February 1958.

\* Approximate range locations from written descriptions and site visits

### 3.10 SOCIOECONOMICS

**Region of Influence** - The ROI for socioeconomics is Redstone Arsenal and the Madison County area. Socioeconomics within this EA is concerned with population and employment in the area.

**Affected Environment** - Although at one time a rural town, Huntsville has emerged as a center for military and space technology with the center of activity in the region located at Redstone Arsenal. This has occurred with the consolidation of Research and Development activities for U.S. Army rocket and missile projects at the Arsenal that continues to contribute to the region's economy. The Arsenal's presence has led to the convergence of a large number of defense contractors in the Madison County area. (U.S. Army Missile Command 1994a)

Redstone Arsenal, as a major employer in Madison County, impacts the local economy through direct employment of civilian and military personnel as well as through the local procurement of goods and services. Direct employment by the Arsenal as well as employment directly generated from the Arsenal's procurement expenditures have led to an increase in the level of economic activity and the creation of additional employment opportunities. (U.S. Army Missile Command 1994a).

The OMMCS training facilities have been in existence for many years. Current OMMCS staff totals 137 civilians and 423 military personnel.

### 3.11 WATER RESOURCES

**Region of Influence** - The ROI for water resources is Redstone Arsenal.

**Affected Environment** - Water resources include both surface water and groundwater. To protect these resources, and human health, Congress has enacted the Clean Water Act and the Safe Drinking Water Act. The EPA has also established water quality standards to protect water resources.

Surface Water - There are numerous sources of surface water on the Arsenal including McDonald Creek, Indian Creek, and Huntsville Spring Branch. These surface waters, like the majority of tributaries on the Arsenal, flow to the south toward the Tennessee River. The main source for potable and industrial water for Redstone Arsenal is Wheeler Reservoir.

There is no surface water present within the OMMCS Headquarters area. The nearest potential surface water is McDonald Creek located to the east of these areas. McKinley Range has several wetland areas and numerous canals; Rock Pond is located in the northeast corner of McKinley Range. Corkern Range is located adjacent to Huntsville Spring Branch. The nearest surface water to the ASP Range and ASP FTX site is Indian Creek located approximately one mile to the west of these areas. The CSA is located near the southern border of Redstone Arsenal with the nearest surface water being the Tennessee River. The nearest surface water to the HDD Range is a nearby inlet of the Tennessee River located to the west of the range. The nearest surface water to the FTX Site, HAWK Hardstand site, and Confidence Course is McDonald Creek. The FTX Site is located on the west side of McDonald Creek, while the HAWK Hardstand Site and the Confidence Course are located on the east side of the creek.

Approximately one-third of the Arsenal lies within the 100-year floodplain of the Tennessee River (U.S. Army Missile Command 1994a). The following OMMCS areas are located within this floodplain: McKinley Range, Corkern Range, and the HDD Range. The following areas are

not located within the floodplain: OMMCS headquarters area, ASP Range, ASP FTX site, CSA, Confidence Course, FTX site, and HAWK Hardstand site.

Groundwater - The hydrogeology of the ROI is composed of three distinct hydrogeologic units: the unconsolidated surficial deposits (regolith), the limestones of the Tuscumbia Limestone and the Fort Payne Chert, and the Chattanooga shale. The Fort Payne Chert and the Tuscumbia Limestone are the principal aquifers in the ROI. The major wells and springs in this area obtain water from irregularly distributed solution cavities and channels in these formations.

Groundwater movement is generally from north to south throughout the ROI, although localized, often complex, disruptions of this southerly flow pattern may occur. In this area, the direction of groundwater flow is ultimately controlled by the Tennessee River, which forms the southern border of Madison County (Rheams *et al.* 1992). The strata of Madison County dip south-southeast at a rate of approximately 20 feet per mile except where local structural abnormalities exist. Groundwater in solution channels along bedding planes and joint system in the limestone moves generally down the slope of the overlying limestone beds. Groundwater has been shown to move downward through the limestone to the shale confining unit then laterally to points of discharge to the south and southeast (Malmberg 1957). In many areas the unconsolidated surficial deposits also act as a confining unit producing artesian pressure in the limestone aquifer. The aquifers in this area are some of the most productive in Madison County. None of the aquifers in Madison County have been designated as sole source aquifers per Section 1424(2)g of the Safe Drinking Water Act of 1974. Groundwater from wells drilled into the limestone aquifer generally produce good quality water which is moderate in dissolved minerals and has an average pH of 7.5 (U.S. Army Missile Command 1994a).

## CHAPTER 4.0

### ENVIRONMENTAL CONSEQUENCES

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Federal environmental laws and regulations were reviewed to determine established thresholds for assessing environmental impacts (if any) under NEPA. Proposed activities were evaluated for their potential to result in significant environmental consequences based on the interpretation of significance outlined in the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR 1500-1508) and AR 200-2, *Environmental Effects of Army Actions*.

CEQ Guidelines (40 CFR 1508.27) specify that significance should be determined in relationship to both context and intensity (severity). Three levels of impact can be identified:

- No Impact - No impact is predicted.
- No Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource.
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource.

Sections 4.1 through 4.11 describe expected impacts to the environment from the proposed action, impacts to the environment from alternatives including the no-action alternative, cumulative impacts, and potential mitigation measures. The amount of detail presented in each section is proportional to the potential for impacts. Sections 4.12 through 4.23 summarize cumulative impacts and mitigation measures, and address other specific NEPA requirements.

#### 4.1 AIR QUALITY.

The following sections describe the impacts to the environment from the proposed action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to air quality.

**4.1.1 Proposed Action.** There would be no significant impacts to air quality due to the continued OMMCS training activities. The locations for the proposed actions have been used for these types of activities previously and training would continue. Air quality impacts could occur during the construction of the proposed structures at McKinley Range and the addition of a sanitary sewer system on the ASP Range. Intermittent construction-related impacts could result from fugitive dust (particulate matter) and construction equipment emissions.

Fugitive dust and combusive emissions would be generated during construction activities. A conservative estimate for uncontrolled fugitive dust (particulate matter) emissions from ground disturbing activities is 1.2 tons per acre per month of activity. Normally, half of these emissions are assumed to be PM<sub>10</sub>.

Combustion emissions would be generated during construction by the internal combustion engines of heavy construction vehicles and equipment. The main emission from heavy duty construction equipment are carbon monoxide, hydrocarbons, nitrogen oxides, aldehydes, sulfur oxides, and particulates. The EPA has tabulated estimates of the amounts of these pollutants emitted for various categories of heavy construction vehicles and equipment based on either the number of hours of operation or the amount of fuel consumed.

The ETDD, Building 3449, within the OMMCS Headquarters area, has 3 classrooms which are primarily used for soldering training. Classrooms 1, 2, and 6 are all equipped with Purafil Filtration Systems. These systems have 3 separate stages to the filtering process. The three filters located within each system are all different and are changed at different times. However, all three systems had new filters installed on August 2, 1995. After the air is filtered through this system, it is vented directly to the outside of the building. These classrooms are not as heavily used as they were in the past, so the filtering systems only receive periodic use. Little air pollution comes from these filtering systems. The Alabama Department of Environmental Management (ADEM) and the MICOM Environmental Office have approved the system and OMMCS has proper documentation for using this system. A ventilation survey has not been completed since the early 1980s.

McKinley Range has three demolition areas for the detonation of live ordnance. These are the Peace Talks site, Phase 3 dig site, and the Telecom Loop site. The ordnance that is detonated must be under 5 pounds net explosive weight, but usually no more than 3 pounds net explosive weight is detonated at any one time. Detonation in these areas is also done following the guidelines described in the range SOPs. There is one burn pit located on the range, which is normally used once per year. No chemicals are burned in the pit, and it is only used for burning pallets, boxes, and other forms of trash. The pit is checked for metal and other items that will not burn before igniting it. The Arsenal fire department is on the scene before items are ignited.

Corkern Range uses an area behind the sand pit for detonating 105mm projectiles. This area is a lowland where the soil is moderately wet throughout the year; however, this area is not considered a wetland. Before the detonation, a four foot deep hole is dug and the projectile is placed and covered with the excavated soil. Upon detonation, ground disturbance is minimal.

Building 2575, located on the ASP Site, contains a small block building approximately 12 feet by 12 feet used as a paint booth. The paint booth has three sides and a ceiling. The back wall of the paint booth is covered with a filtering system. When painting is in progress, the paint is sprayed toward the back of the booth so the filtering system captures the paint fumes and dust associated with the spray process. There is a manometer located on the side of the booth that measures the amount of fumes captured so it is known when to change the filters. When the meter moves three increments on the dial, operations are stopped so the filters can be changed. Air from this process is exhausted through a piping system directed out the side of the building.

The HDD Range has a sand pit in which explosives are detonated. A maximum of 2.5 pounds net explosive weight of explosives is detonated at one time. The explosives are set in the center of the sand pit above ground when they are detonated. The bulk of the sand thrown into the air during detonation is dispensed horizontally. The sand rarely generates in a vertical manner. SOPs in conjunction with training lesson plans are followed before detonating any explosives.

Projected impacts to air quality from the construction of the structures on McKinley Range and the addition of the sanitary sewer system on the ASP Range are expected to be not significant because fugitive dust and combustion emissions can be mitigated; the emissions are not expected to contribute to the long-term cumulative impacts on air quality of the area.

**4.1.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the

proposed action. There would be no impacts to air quality since no change would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.1.3 Cumulative Impacts.** No cumulative air quality impacts are anticipated for the proposed action in combination with other activities in the area. The proposed action would take place in a small area with minimal amounts of activity occurring at any one time.

**4.1.4 Mitigation Measures.** Construction-related emissions of fugitive dust and exhaust products would depend on the amount of construction and earthwork performed and the construction mobilization schedule. Fugitive dust from ground-disturbing activities can be reduced up to 50 percent by regular site-watering practices.

**4.2 BIOLOGICAL RESOURCES.** Criteria for determining the significance of potential impacts to biological resources are based on the importance of the resource, the number or amount of the resource that would be impacted, the sensitivity of the resource to the proposed activities, and the duration of the impact. Impacts are considered significant if they are determined to have the potential to result in reduction of the population size of Federally or state-listed threatened or endangered species, degradation of biologically important unique habitats, or substantial long-term loss of vegetation and capacity of a habitat to support wildlife (i.e. negatively impact biodiversity).

#### **4.2.1 OMMCS Headquarters Area**

Vegetation - Since training activities in this area would continue without change under the proposed action, and vegetation has not been impacted by previous activities, no impacts are expected to the vegetation resources from training activities.

Fish and Wildlife - Since training activities in this area would continue without change under the proposed action, no impacts are expected to wildlife resources from training activities. There are no aquatic resources in this area to support fish and other aquatic organisms.

Aquatic Resources, Threatened and Endangered Species, Wetlands, and Unique Habitats - Since none of these resources have been identified for this area, no impacts are expected to these resources.

**4.2.2 McKinley Range.** While there are no new training operations planned for McKinley Range, there is a specific proposed construction action for the range as described in Section 2.2.1.2.

Vegetation - Since training activities on the range would continue without change under the proposed action, and vegetation has not been impacted by previous activities, no impacts are expected to the vegetation resources from training activities.

The site of the proposed new building at McKinley Range is a motor park. There is no vegetation on this site. There would be no impacts to the long term health and diversity of the vegetation resources from the proposed action. Short term impacts to the vegetation resources (primarily existing sod removal from around the motor park) are expected to be not significant and can be mitigated by best management practices (e.g., siltation barriers, hay bales) during construction activities. No further impacts to vegetation resources are expected from the installation of the underground training bunker/tornado shelter since the area has been previously disturbed.

Fish and Wildlife - Since training activities on the range would continue without change under the proposed action, no impacts are expected to fish and wildlife resources from training activities.

Short term impacts to wildlife resources in the area of the proposed construction sites are not expected to be significant. Wildlife that use the area may be temporarily displaced during construction due to noise and construction activities. Once construction is completed, wildlife would be expected to move back into the area. Actions can impact wildlife through habitat loss or by direct mortality. Direct mortality does occur infrequently due to explosions and more frequently for non-motile species. Wildlife mortality is probably reduced by human activity in the area immediately before a blast, but it is not eliminated. No fisheries resources exist at the sites of the proposed construction. In the long term, no impacts are expected to the fish and wildlife resources of the area.

Aquatic Resources - Since Rock Pond and the various canals on the range are not used for any training activities, and those training activities on the range do not occur on or in the pond or canals, no impacts are expected to these resources from training activities.

There are no aquatic resources at the site of the proposed building or underground training bunker/tornado shelter. Short term impacts from potential runoff during construction activities would be experienced but are expected to be not significant. These impacts can be mitigated through the use of best management practices (e.g., siltation barriers, hay bales) by the selected construction contractors.

Threatened and Endangered Species - No listed threatened or endangered species are known to exist on McKinley Range. A candidate species, the dwarf trillium (*Trillium pusillum*), has the potential to exist in wetland areas on McKinley Range. Since training activities on McKinley Range would continue without change under the proposed action there is the potential for adverse impacts to populations of dwarf trillium which may exist in wetland areas.

Since no threatened or endangered species are known to exist on the proposed construction sites, there are no impacts expected from the proposed action to construct the building and underground training bunker/tornado shelter.

Wetlands - A tupelo swamp is present to the north of Building 8001 (Snake Pit). This wetland area is the closest one to impact areas on this range. The dwarf trillium can be found in zones around tupelo swamps. Since current training activities on McKinley Range, which reportedly all take place outside wetland areas, would continue without change under the proposed action, no impacts are expected to wetland areas from training activities.

The proposed new building being considered is to be constructed in a non-wetland portion of McKinley Range. Therefore, no impacts are expected to wetland areas on this range from this proposed construction. The proposed underground training bunker/tornado shelter is to be installed in an upland portion of the range previously impacted by OMMCS activities. No impacts to wetland areas are expected.

Unique Habitats - Since the unique habitats identified from McKinley Range are not used for any training activities, no impacts are expected to these resources from training activities.

#### **4.2.3 Corkern Range**

Vegetation - Since training activities on the range would continue without change under the proposed action, no impacts are expected to vegetation resources on the range.

Fish and Wildlife - There are no fish on Corkern Range. Since training activities on the range would continue without change under the proposed action, no impacts are expected to wildlife resources on the range.

Aquatic Resources - The northern boundary of the Wheeler National Wildlife Refuge is located on the southern end of Corkern Range. Since no training activities are reported to take place in this area, no impacts are expected to these resources.

Threatened and Endangered Species - Since no threatened or endangered species are known to exist on Corkern Range, no impacts are expected to these resources.

Wetlands - Previous activities on the range included the use of mechanized equipment in these wetland areas but these activities in the wetland areas have been discontinued (Weber 1996). Since training activities on the range would continue without change under the proposed action, and wetland areas are no longer being impacted by current activities, no impacts are expected to wetland areas on this range.

Unique Habitats - Since no unique habitats are known to exist on Corkern Range, no impacts are expected to these resources. The northern boundary of the Wheeler National Wildlife Refuge is located on the southern end of Corkern Range. Since no training activities are reported to take place in this area, no impacts are expected to these resources.

#### **4.2.4 ASP Site**

**4.2.4.1 ASP Range.** While there are no new training operations planned for the ASP Range, there is a specific proposed construction action for this range as described in Section 2.2.1.4.

Vegetation - Since training activities on the range would continue without change under the proposed action, no impacts are expected to vegetation resources from training activities.

No significant impacts would be expected to ASP Range vegetation resources due to the proposed new sanitary sewer system. An area of sod would be removed during the sanitary sewer installation, but this would be replaced in a short time with no impacts expected for the remaining vegetation resources.

Fish and Wildlife - There are no fish located on the ASP Range. Since training activities on the range would continue without change under the proposed action, no impacts are expected to wildlife resources from training activities.

No significant impacts would be expected to wildlife resources in the area of the proposed new sanitary sewer system during construction. Wildlife that use the area may be temporarily displaced during construction due to noise and construction activities. Once construction is completed wildlife can be expected to move back into the area. In the long term, no impacts are expected to the range wildlife resources.

Aquatic Resources, Threatened and Endangered Species, and Wetlands - Since none of these resources are known to exist on the ASP Range, no impacts are expected to these resources from training activities or the proposed sanitary sewer system.

Unique Habitats - Since the proposed action is to take place to the south of the Matthews Cave recharge area there would be no impacts expected to this unique habitat from the proposed actions.

Due to the importance of groundwater resources to cave-dwelling threatened and endangered species, which have the potential to inhabit caves in this area, DPW officials decided that the installation of a sanitary sewer system would be more protective of these resources than an on-site septic system. No impacts are expected to unique habitats from implementation of the proposed action to install a sanitary sewer system at the ASP Range.

No impacts are expected to these resources from training activities taking place on this range.

#### **4.2.4.2 ASP FTX Site**

Vegetation - Since training activities on the ASP FTX site would continue without change under the proposed action, and vegetation has not been impacted by previous activities, no impacts are expected to vegetation resources on the site.

Fish and Wildlife - There are no fish on the ASP FTX site. Since training activities on the site would continue without change under the proposed action, and wildlife has not been impacted by previous activities, no impacts are expected to wildlife resources on the site.

Aquatic Resources, Threatened and Endangered Species, Wetlands, and Unique Habitats - Since none of these resources are known to exist on the ASP FTX site, no impacts are expected to these resources.

#### **4.2.5 HDD Range**

Vegetation - Since training activities on the HDD Range would continue without change under the proposed action, and vegetation has not been impacted by previous activities, no impacts are expected to vegetation resources.

Fish and Wildlife - There are no fish on the HDD Range. Since training activities at the range would continue without change under the proposed action, and wildlife has not been impacted by previous activities, no impacts are expected to wildlife resources.

Aquatic Resources, Threatened and Endangered Species, and Unique Habitats - Since none of these resources are known to exist on the HDD Range, no impacts are expected to these resources.

Wetlands - Since training activities on the HDD Range would continue without change under the proposed action, and nearby wetland areas have not been impacted by previous activities, no impacts are expected to wetland areas on the range.

#### **4.2.6 FTX Site**

Vegetation - Since training activities at the FTX Site would continue without change under the proposed action, and vegetation has not been impacted by previous activities, no impacts are expected to vegetation resources.

Fish and Wildlife - There are no fish at the FTX Site. Since training activities at the site would continue without change under the proposed action, and wildlife has not been impacted by previous activities, no impacts are expected to wildlife resources.

Aquatic Resources, Threatened and Endangered Species, and Unique Habitats - Since none of these resources are known to exist at the FTX Site, no impacts are expected to these resources.

Wetlands - Since training activities at the FTX Site would continue without change under the proposed action, and wetland areas on the range are not being impacted by current activities, no impacts are expected to wetland areas on the range.

#### **4.2.7 HAWK Hardstand Site**

Vegetation - Since training activities at the HAWK Hardstand site would continue without change under the proposed action, and vegetation has not been impacted by previous activities, no impacts are expected to vegetation resources.

Fish and Wildlife - There are no fish at the HAWK Hardstand site. Since training activities at the site would continue without change under the proposed action, and wildlife has not been impacted by previous activities, no impacts are expected to wildlife resources.

Aquatic Resources, Threatened and Endangered Species, Wetlands, and Unique Habitats - Since none of these resources are known to exist at the HAWK Hardstand site, no impacts are expected to these resources.

#### **4.2.8 Corps Storage Area**

Vegetation - Since training activities at the CSA would continue without change under the proposed action, and vegetation has not been impacted by previous activities, no impacts are expected to vegetation resources at the area as long as personnel stay in cleared areas considered uplands. The initial establishment of Kudzu as a quick vegetative erosion control plant has resulted in a maintenance and safety problem due to its uncontrolled, excessive growth.

Fish and Wildlife - There are no fish at the CSA. Since training activities at the area would continue without change under the proposed action, and wildlife has not been impacted by previous activities, no impacts are expected to wildlife resources at the area.

Aquatic Resources, Threatened and Endangered Species, Wetlands, and Unique Habitats - Since none of these resources are known to exist at the CSA, no impacts are expected to these resources.

#### **4.2.9 Confidence Course**

Vegetation - Since training activities at the Confidence Course would continue without change under the proposed action, and vegetation has not been impacted by previous activities, no impacts are expected to vegetation resources at the area.

Fish and Wildlife - There are no fish at the Confidence Course area. Since training activities at the area would continue without change under the proposed action, and wildlife has not been impacted by previous activities, no impacts are expected to wildlife resources at the area.

Aquatic Resources - Since training activities at the Confidence Course would continue without change under the proposed action, and nearby aquatic resources (McDonald Creek) have not been impacted by previous activities, no impacts are expected to aquatic resources at the area.

Threatened and Endangered Species - Since no threatened or endangered species are known to exist at the Confidence Course, no impacts are expected to these resources.

Wetlands - Since no wetland areas are known to exist at the Confidence Course, no impacts are expected to these resources.

Unique Habitats - Training activities on this range should avoid the spring near the old homesite and areas upstream. Since no training activities are to take place in the spring or other sensitive areas near the Confidence Course, no impacts are expected to these resources.

**4.2.10 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning. There would be no impacts to biological resources since no change in training activities would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.2.11 Cumulative Impacts.** No other activities have been identified that, together with the proposed action, would have the potential for cumulative impacts on biological resources.

**4.2.12 Mitigation Measures.** Range(s) Standard Operating Procedures will be modified to specify operational/training restrictions around sensitive biological resource areas.

The site of the proposed new building at McKinley Range is currently a motor park. Short term impacts to surrounding vegetation resources (primarily sod) are expected to be not significant and can be mitigated by best management practices (e.g., siltation barriers, hay bales) during construction activities. Short term impacts to wildlife resources in the area of the proposed new building at McKinley Range are expected to be not significant during building construction. Wildlife that use the area may be temporarily displaced during construction due to noise and construction activities. Once construction is completed, wildlife would be expected to move back into the area. There are no aquatic resources at the site of the proposed new building. However, the new building will be south of a tupelo swamp the soldiers have dubbed “snake pit,” which is environmentally sensitive to sedimentation (Weber, 1996). Measures should be taken during construction to protect this tupelo swamp from construction erosion. Short term impacts from potential runoff during construction activities would be experienced but are not expected to be significant. These impacts can be mitigated through the use of best management practices (e.g., siltation barriers, hay bales) by the selected construction contractors. Drip pans are also placed under vehicles stored in the motor park as a precautionary measure and to avoid any soil and groundwater contamination from leaking vehicles.

No impacts to natural resources are expected from the installation of an underground training bunker/tornado shelter on McKinley Range. The structure is to be installed on a knoll approximately 800 feet north of Building 8001. No mitigation measures are necessary for installation of this structure in this area which has been previously disturbed by earth moving activities.

No significant impacts would be expected to vegetation resources of the ASP Range due to the proposed new sanitary sewer system. An area of sod would be removed during the sanitary sewer installation, but this would be replaced in a short time with no impacts expected for the remaining vegetation resources. No significant impacts would be expected to wildlife resources in the area of the proposed new sanitary sewer system during construction. Wildlife that utilize the area may be temporarily displaced during construction due to noise and construction activities. Once construction is completed, wildlife can be expected to move back into the area. Actions can impact wildlife through habitat loss or by direct mortality. Direct mortality does occur infrequently due to explosions and more frequently for non-motile species. Wildlife mortality is probably reduced by human activity in the area immediately before a blast, but it is not eliminated.

**4.3 CULTURAL RESOURCES.** Cultural and archaeological resources are limited, nonrenewable resources whose potential for scientific research or value as a traditional resource may be easily diminished by actions which significantly impact the integrity of the property. Activities that disturb the ground in which an archaeological site is present can destroy temporally and culturally diagnostic artifacts and features or alter artifact provenance. Such alterations to the integrity of a property precludes possible determination that the site may be likely to yield information important in prehistory or history. Significance of impacts is determined by the intensity and context of the alteration of the distinctive characteristics and integrity of a property.

**4.3.1 Proposed Action.** Since training activities at the OMMCS facilities would continue without change under the proposed action, and cultural resources have not been impacted by previous activities, no impacts are expected from the continuation of training operations. The locations of the OMMCS training activities have been used for these types of activities previously. Continuing mission activities at Redstone Arsenal avoids the additional environmental, safety, and cost concerns associated with performing the OMMCS mission elsewhere for execution of the same effort.

While there are no new training operations planned for McKinley Range and ASP Range, there are specific proposed actions for these ranges. The proposed action for McKinley Range is the construction of a building southeast of the existing Building 8001 in an area currently occupied by a motor park. On May 8, 1995, Scott Shaw, Staff Archaeologist for the MICOM Environmental Management and Planning Directorate, conducted a cultural resource assessment of the proposed building site (Shaw 1995). This survey identified both a cemetery (Lynch Cemetery located east of Building 8001) and an archaeological site to the west of the proposed building site. The recommended mitigation is to site the new building no closer than 50 feet from Lynch Cemetery and to not construct a building on the east side of the cemetery due to the potential for graves being located outside the fenced borders of the cemetery. A further recommended mitigation is that no earth moving activities be conducted west of the motor park because of the archaeological material discovered there.

In addition, there is a proposal to install an underground training bunker/tornado shelter on a knoll approximately 800 feet to the north of Building 8001. A cultural resource assessment of this site indicated no archaeological or cultural resources were located in this area.

The proposed action for the ASP Range is to install a sanitary sewer system at an existing double-wide trailer located just west of Building 2592. This trailer has existing toilet facilities that are

currently unusable because of the lack of a sanitary sewer system. Portable toilets are currently used at the ASP Range.

According to Mr. Shaw, there are no archaeological sites or structures of any historical significance located in the specific areas of the proposed action. Therefore, no significant impacts to cultural resources are expected provided that the mitigation measures discussed above are followed. The Alabama SHPO will be consulted by MICOM to determine their concerns regarding the proposed action.

**4.3.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. There would be no impacts to cultural resources, however, since no change would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.3.3 Cumulative Impacts.** No other activities have been identified that, together with the proposed action, would have the potential for cumulative impacts on cultural resources.

**4.3.4 Mitigation Measures.** Range(s) Standard Operating Procedures will be modified to specify operational/training restrictions around sensitive cultural resource areas.

The recommended mitigation for the proposed construction on McKinley Range is to site the new building no closer than 50 feet from Lynch Cemetery and to perform no construction on the east side of the cemetery due to the potential for graves being located outside the fenced borders of the cemetery. The new building would be sited southeast of existing Building 8001 in an area currently occupied by a motor park. Also, no earth moving activities should be conducted west of the motor park because of the archaeological material discovered there. No mitigation measures are necessary for the installation of the underground training bunker/tornado shelter.

If during construction or training activities, personnel observe items that might have historical or archaeological value, they will report their observations immediately to OMMCS management, who will notify the Arsenal's Cultural Resources Manager to determine their significance and any special disposition of the finds. Construction operations or training activities in that area would cease to prevent trespassing on, removing, or otherwise damaging such resources.

## **4.4 HAZARDOUS MATERIALS AND WASTE**

**4.4.1 Proposed Action.** No impacts would be expected from the construction of the structures at McKinley Range and the installation of the sanitary sewer system at the ASP Range. These would be considered minor construction efforts and would not affect hazardous materials and waste.

**4.4.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. There would be no impacts to hazardous materials and waste since no change would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.4.3 Cumulative Impacts.** No other activities have been identified that, together with the proposed action, would have the potential for cumulative impacts on hazardous materials and waste.

**4.4.4 Mitigation Measures.** Since there would be no impacts to hazardous materials and waste with the continuation of training activities, no mitigation measures are necessary. No impacts are expected from the installation of a new sanitary sewer system to the ASP Range, the construction of a new building or the installation of an underground training bunker/tornado shelter on McKinley Range; therefore, no mitigation measures are necessary.

## **4.5 HEALTH AND SAFETY**

**4.5.1 Proposed Action.** Health and safety impacts could occur due to construction of the structures at McKinley Range and the installation of the sanitary sewer system at the ASP Range. Potential impacts to health and safety from these activities would be minimized by using established safety procedures. These include AR 385-10, *Safety*, and all appropriate OSHA regulations including 29 CFR Part 1926, *Safety and Health Regulations for Construction*, that would be followed during the course of all demolition and construction activities. The selected building contractor would obtain a NPDES construction permit from the Alabama Department of Environmental Management. The selected building contractor would comply with the NPDES permit requirements as well as all applicable Federal, state, and local laws and regulations during demolition or construction and when removing and disposing of asbestos-containing materials or lead-based paint.

OMMCS facilities are not used for the destruction of ammunition or explosive ordnance disposal (EOD). Live ordnance demolition is performed only for training and not for disposal purposes. Range activities are used to conduct training using Army-specific EOD tools and equipment. Activities such as these are considered to be routine and have been conducted at the Arsenal for many years. Therefore, impacts from the proposed action are considered to be not significant and mitigable.

The dual use of the underground training bunker/tornado shelter would improve the mission and mission safety at the south end of the Arsenal, where few school facilities exist that offer shelter to students during severe weather.

**4.5.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. There would be no impacts to health and safety from the proposed action since no change in the training activities would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.5.3 Cumulative Impacts.** No other activities have been identified that, together with the proposed action, would have the potential for cumulative impacts on health and safety.

**4.5.4 Mitigation Measures.** Mitigation measures for normal operations at the OMMCS facilities and ranges that are currently in effect and should be maintained include:

- storage of hazardous materials with flashpoints less than 141° F inside flammable safety cabinets,

- training of all personnel per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200),
- the participation of personnel involved in calibration and repair of meters involving radioactive sources in a three week Radiation Protection course,
- minimizing the inhalation potential from explosive materials by conducting all demolition activities outdoors,
- instructing personnel to avoid touching sensitive areas of the body when working with explosives and to wash their hands after working with explosives (especially before consuming food),
- using lead vests when working around X-ray machines,
- continuing to have the Arsenal Fire Department stand by during demolition activities conducted during dry weather, and
- having MSDSs and chemical inventories available at all locations.

## 4.6 INFRASTRUCTURE AND TRANSPORTATION

**4.6.1 Proposed Action.** There would be no impacts to infrastructure and transportation due to the continued OMMCS training activities. The locations of the proposed action have been used for these types of activities previously. The OMMCS training facilities have adequate existing electrical power supplies, and there is no need to increase those supplies. There is no existing natural gas requirement at any of the sites and none is required. The existing water supplies (whether through the existing Arsenal water supply or through bottled water for drinking) is in place, and there is no need to increase the supply. Wastewater treatment facilities are in place, and there is no need to increase those facilities. Dumpsters would remain in place throughout the OMMCS facilities for basic solid waste disposal use. No additional dumpsters are required under the proposed action. The existing transportation (roadway) system on the Arsenal would be adequate to serve the proposed activities.

There are no impacts to infrastructure and transportation expected from the proposed action to construct the new structures on McKinley Range. There is an existing motor park in the area proposed for the new building and the expected area of development is small. The area identified for the underground training bunker/tornado shelter is also small and has been previously impacted by earth moving activities. Additional electrical requirements would be minimal, water lines are in place to the area, additional dumpster requirements would be minimal, and new roads would not be required.

There would be no significant impacts expected from the installation of a sanitary sewer system on the ASP Range. The sanitary sewer system, which is more protective of the groundwater resources than a septic tank, would replace the existing portable toilets at the site. Additional electrical requirements would be minimal, water lines are in place to the area, no additional dumpsters would be required, and new roads would not be required.

**4.6.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. There would be no impacts to infrastructure and transportation since no change would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.6.3 Cumulative Impacts.** Since no infrastructure and transportation impacts have been identified for the proposed action, the potential for incremental, cumulative impacts does not exist.

**4.6.4 Mitigation Measures.** Since no infrastructure and transportation impacts have been identified for the proposed action, no mitigation measures are necessary.

## **4.7 LAND USE**

**4.7.1 Proposed Action.** There would be no impacts to land use due to the continued OMMCS training activities. The locations of the OMMCS facilities have been used for these types of training activities previously. Continuing mission activities at Redstone Arsenal avoids the additional environmental, safety, and cost concerns associated with performing the OMMCS mission elsewhere for execution of the same effort. There are no changes planned for any of the areas under the proposed action.

There are no land use impacts expected from the proposed action to construct new structures on McKinley Range and a sanitary sewer system on the ASP Range. There is an existing motor park in the area proposed for the new building and the expected area of development is small for both the new building the underground training bunker/tornado shelter and the sanitary sewer system.

**4.7.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. There would be no impacts to land use since no change would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.7.3 Cumulative Impacts.** Since no land use impacts have been identified for the proposed action, the potential for incremental, cumulative impacts does not exist.

**4.7.4 Mitigation Measures.** Since no land use impacts have been identified for the proposed action, no mitigation measures are necessary.

## 4.8 NOISE

**4.8.1 Proposed Action.** There would be no significant impacts from noise due to the continued OMMCS training activities. Training operations are conducted in an environmentally conscientious manner, so as to minimize the potential for noise impacts. The locations of the various sites used for OMMCS activities have been used for these types of training activities previously, and the sites are located either within remote areas or inside existing buildings. There are no sensitive noise receptors (e.g., endangered species, hospitals, schools) located near the training sites, although wildlife in the area is a noise receptor and Farley School (located outside of the Arsenal boundaries) is approximately 2.5 miles from the HDD Range.

The training activities that produce noise are considered to be consistent with Arsenal operations. The noise producing activities are not continuous and occur only for very short periods of time. These operations are brief and similar to past training operations. At no time do training operations personnel conduct simultaneous exercises that result in significant noise impacts. Training operations are conducted in controlled areas with no significant increase planned over current operations. Entry to the training areas is limited to only essential personnel (instructors and students).

The Arsenal would take measures to reduce noise such as monitoring weather to avoid the use of ranges when conditions (i.e., temperature, humidity, wind, and cloud cover) are not favorable. Unacceptable Arsenal noise production would be stopped until conditions are proper to avoid complaints.

Trained personnel (instructors and students) would follow in-place regulations for hearing protection and noise attenuation. Hearing protection that is currently used (i.e., foam rubber earplugs and ear muffs) would continue to be used. In some locations (McKinley Range, Corkern Range, HDD Range), thick vegetation around the ranges would assist in acting as a noise barrier during explosives detonation activities. The Corkern Range would continue to use its bunker for additional protection for personnel when training includes the detonation of 105mm shells. Ear muffs would continue to be used within Building 2575 at the ASP Range since this building has a paint booth within it that generates noise during painting operations.

The existing HDD Range bunker (now unavailable for use due to peeling lead-based paint on the bunker's ceiling) is expected to be eventually replaced with a concrete bunker so that it can be used for additional protection.

Noise sources that may occur as a result of the proposed action to construct new structures on McKinley Range and a sanitary sewer system on the ASP Range include activities such as construction vehicle traffic and construction equipment noise. Projected impacts from construction activities are not expected to be significant with reductions in noise activities and confinement of noise producing activities to restricted hours.

**4.8.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. Potential noise impacts would continue at the OMMCS locations, but they would not be expected to be significant since no change in training activities would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.8.3 Cumulative Impacts.** No other activities have been identified that, together with the proposed action, would have the potential for cumulative noise impacts. The noise producing activities are not continuous and occur for very short periods of time. At no time do training operations personnel conduct simultaneous exercises that result in significant noise impacts.

**4.8.4 Mitigation Measures.** Trained personnel (instructors and students) would follow all applicable in-place regulations for hearing protection and noise attenuation. Hearing protection that is currently used (i.e., foam rubber earplugs and ear muffs) would continue to be used. The Corkern Range would continue to use its bunker for additional protection for personnel when training includes the detonation of 105mm shells. Ear muffs would continue to be used within Building 2575 at the ASP Range since this building has a paint booth within it that generates noise during painting operations. The HDD Range expects to eventually replace the existing bunker (now unavailable for use due to peeling lead-based paint on the bunker's ceiling) with a concrete bunker so that it can be used for additional protection. At no time would training operations personnel conduct simultaneous exercises that result in significant noise impacts. Training operations are conducted in controlled areas with no significant increase over current operations. Entry to the training areas is limited to only essential personnel (instructors and students). The Arsenal would take measures to reduce noise such as monitoring weather to avoid the use of ranges when conditions (i.e., temperature, humidity, wind, and cloud cover) are not favorable. Unacceptable Arsenal noise production would be stopped until conditions are proper to avoid any complaints. Projected impacts from construction activities would be mitigated by confining noise producing activities to restricted hours.

## **4.9 GEOLOGY AND SOILS**

**4.9.1 Proposed Action.** No significant impacts would be expected from the construction of the structures at McKinley Range or the sanitary sewer system on the ASP Range. During construction activities, siltation barriers would be used to minimize the amount of sediment runoff to the surrounding areas. The dual use of the underground training bunker/tornado shelter would improve the mission and mission safety at the south end of the Arsenal, where few school facilities exist that offer shelter to students during severe weather. Since the soil over the complex would also be stabilized, less hazard to the environment would exist (particularly to the tupelo swamp to the west).

**4.9.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. There would be no impacts to geology and soils from the proposed action since no change in training activities would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.9.3 Cumulative Impacts.** No other activities have been identified that, together with the proposed action, would have the potential for cumulative impacts on geology and soils.

**4.9.4 Mitigation Measures.** During construction activities, siltation barriers would be used to minimize the amount of sediment runoff to the surrounding areas.

## **4.10 SOCIOECONOMICS**

**4.10.1 Proposed Action.** Since training activities at the OMMCS facilities would continue without change under the proposed action, and socioeconomics has not been impacted by previous activities, no impacts are expected from the continuation of training operations. The locations of the OMMCS training activities have been used for these types of activities previously. Continuing mission activities at Redstone Arsenal avoids the additional environmental, safety, and cost concerns associated with performing the OMMCS mission elsewhere for execution of the same effort. The population of the overall area would not be affected (because there would be no change in staffing or area population), and the local and regional employment outlook and area income would not change due to this activity.

No impacts would be expected from the construction of the building at McKinley Range and the installation of the sanitary sewer system at the ASP Range. These would be considered minor construction efforts and would not affect the population of the overall area, the staffing requirements of the facilities, the local or regional employment outlook, or the area income.

**4.10.2 No-Action Alternative.** If the No-Action Alternative is chosen, it would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. There would be no impacts to socioeconomics from the proposed action since no change in training activities would occur. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.10.3 Cumulative Impacts.** No other activities have been identified that, together with the proposed action, would have the potential for cumulative impacts on socioeconomics.

**4.10.4 Mitigation Measures.** Since no socioeconomic impacts have been identified for the proposed action, no mitigation measures are necessary.

#### **4.11 WATER RESOURCES**

**4.11.1 Proposed Action.** Since training activities at the OMMCS facilities would continue without change under the proposed action, and water resources have not been significantly impacted by previous activities, no significant impacts are expected from the continued training operations. The proposed sanitary sewer system at ASP Range would provide better protection to water resources than the existing septic system.

No significant impacts would be expected from the construction of the structures at McKinley Range or the sanitary sewer system on the ASP Range. During construction activities, siltation barriers would be used to minimize the amount of sediment runoff to the surrounding areas.

**4.11.2 No-Action Alternative.** There would be no significant impacts to water resources anticipated. Existing training activities at the OMMCS facilities would continue as scheduled.

**4.11.3 Cumulative Impacts.** No other activities have been identified that, together with the proposed action, would have the potential for cumulative impacts on water resources.

**4.11.4 Mitigation Measures.** During construction activities, siltation barriers would be used to minimize the amount of sediment runoff to the surrounding areas.

**4.12 CUMULATIVE IMPACTS SUMMARY.** No cumulative impacts are anticipated for the proposed action in combination with other activities in the area.

**4.13 MITIGATION MEASURES SUMMARY.** Current range SOPs that guide OMMCS activities were reviewed for this EA. The SOPs were found lacking of language and guidance protective of the resources covered in this assessment. Current range SOPs should be updated to reflect training operations that are conscious of and protective towards these resources. Mitigation measures are not required for hazardous materials and waste, infrastructure and transportation, land use, and socioeconomics because no impacts were identified for these resources. Mitigation measures for the remaining resources are summarized below.

***Air Quality*** - Construction-related emissions of fugitive dust and exhaust products would be reduced by regular site-watering practices.

***Biological Resources*** - Properly applied OMMCS management directives and guidelines, compliance with applicable laws and regulations, and environmental management oversight from the Directorate of Environmental Management and Planning would be used to ensure that training activities do not impact the rich biological resources of this immediate area or surrounding areas. The OMMCS would continue to prohibit the use of mechanized equipment in wetland areas during training.

Short term impacts to vegetation resources (primarily existing sod removal) during construction activities would be mitigated by best management practices (e.g., siltation barriers, hay bales). The McKinley Range new building will be south of a tupelo swamp which is environmentally sensitive to sedimentation. Measures would be taken during construction to protect this tupelo swamp from construction erosion. Drip pans are also placed under vehicles stored in the motor park as a precautionary measure and to avoid any soil and groundwater contamination from leaking vehicles.

***Cultural Resources*** - The recommended mitigation for the proposed building construction on the McKinley Range is to site the new building no closer than 50 feet from Lynch Cemetery and to not construct a building on the east side of the cemetery due to the potential for graves being located outside the fenced borders of the cemetery. The new building would be sited southeast of the existing Building 8001 in an area currently occupied by a motor park. Also, no earth moving activities should be conducted west of the motor park because of the archaeological material discovered there.

If during construction or training activities, personnel observe items that might have historical or archaeological value, they will report their observations immediately to OMMCS management, who will notify the Arsenal's Cultural Resources Manager to determine their significance and any special disposition of the finds. Construction operations or training activities in that area would cease to prevent trespassing on, removing, or otherwise damaging such resources.

***Health and Safety*** - Mitigation measures for normal operations at the OMMCS facilities and ranges that are in effect now and should be maintained include:

- storage of hazardous materials with flashpoints less than 141° F inside flammable safety cabinets,
- training of all personnel per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200),

- the participation of personnel involved in calibration and repair of meters involving radioactive sources in a three week Radiation Protection course,
- minimizing the inhalation potential from explosive materials by conducting all demolition activities outdoors,
- instructing personnel to avoid touching sensitive areas of the body when working with explosives and to wash their hands after working with explosives (especially before consuming food),
- using lead vests when working around X-ray machines,
- continuing to have the Arsenal Fire Department stand by during demolition activities conducted during dry weather, and
- having MSDSs and chemical inventories available at all locations.

Impacts to health and safety due to construction at McKinley Range and the installation of the sanitary sewer system at the ASP Range would be minimized by using established safety procedures such as AR 385-10, *Safety*, and all appropriate OSHA regulations including 29 CFR Part 1926, *Safety and Health Regulations for Construction*. The selected building contractor would obtain a NPDES construction permit from the ADEM. The selected building contractor would comply with the NPDES permit requirements as well as all applicable Federal, state, and local laws and regulations during construction.

**Noise** - Trained personnel (instructors and students) would follow applicable regulations for hearing protection and noise attenuation. Hearing protection that is currently used (i.e., foam rubber earplugs and ear muffs) would continue to be used. The Corkern Range would continue to use its bunker for additional protection for personnel when training includes the detonation of 105mm shells. Ear muffs would continue to be used within Building 2575 at the ASP Range since this building has a paint booth within it that generates noise during painting operations. The HDD Range would replace the existing bunker (now unavailable for use due to peeling lead-based paint on the bunker's ceiling) with a concrete bunker for additional protection. At no time would training operations personnel conduct simultaneous exercises that result in significant noise impacts. The Arsenal would take measures to reduce noise such as monitoring weather to avoid the use of ranges when conditions (i.e., temperature, humidity, wind, and cloud cover) are not favorable. Unacceptable Arsenal noise production would be stopped until conditions are proper to avoid any complaints. Projected impacts from construction activities would be mitigated by confining noise producing activities to restricted hours.

**Geology and Soils and Water Resources**- During construction activities, siltation barriers would be used to minimize the amount of sediment runoff to the surrounding areas.

**4.14 INDIVIDUALS/ORGANIZATIONS RESPONSIBLE FOR OBTAINING REQUIRED PERMITS/LICENSES/ENTITLEMENTS.** There are no permits/licenses/entitlements required to continue OMMCS training activities. The building contractor(s) selected to construct the new building and sanitary sewer system on OMMCS-controlled land would obtain a NPDES construction permit from the Alabama Department of Environmental Management. The contractor would comply with the requirements of this NPDES permit as well as all applicable Federal, state, and local laws and regulations during construction activities.

**4.15 CONFLICTS WITH FEDERAL, STATE, OR LOCAL LAND USE PLANS, POLICIES, AND CONTROLS.** The proposed action would have no impact on existing land

use itself and presents no conflicts with Federal, regional, state, or local land use plans, policies, or controls.

**4.16 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL.** Anticipated energy requirements of program activities can be accommodated within the energy supply of the region. Energy use would follow established energy conservation practices.

**4.17 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL.** Other than the use of vehicle fuels for training and construction activities, no significant use of natural or depletable resources is required by the proposed action.

**4.18 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES.** Although the proposed action would result in some irreversible and irretrievable commitment of resources such as fuel and labor, this commitment of resources is not significantly different from that necessary for regular activities taking place during OMMCS training activities or on the Arsenal in general.

**4.19 BIOLOGICAL DIVERSITY.** Biological diversity (biodiversity), or the variety of life and its processes, is a basic property of nature that provides enormous ecological, economic, and aesthetic benefits. The loss of biodiversity is recognized as a major national as well as global concern with potentially profound ecological and economic consequences. The “Ecosystem Management Policy Directive” issued in 1994 by DoD’s Deputy Under Secretary of Defense, articulates the biodiversity conservation policy embraced by the DoD and the military departments. The goal of this policy is to:

*“Maintain and improve the sustainability and native biodiversity of terrestrial and aquatic, including marine, ecosystems while supporting human needs, including the DoD mission.”*

Conservation of biodiversity is a national goal provided for in the framework of NEPA. This goal is to anticipate and evaluate the effects of federal actions on biodiversity and actively manage for the reduction of the impact of these effects as well as the promotion of restoration to previously impacted areas. The DoD Environmental Conservation Instruction, signed in 1996, lays out specific management tactics to achieve conservation goals:

- *“Maintain or restore remaining native ecosystem types across their natural range of variation.”*
- *“Maintain or reestablish viable populations of all native species in areas of natural habitat, when practicable.”*
- *“Maintain evolutionary and ecological processes, such as disturbance regimes, hydrological processes, and nutrient cycles.”*
- *“Manage over sufficiently longtime periods to allow for changing system dynamics.”*
- *“Plan to accommodate human use as necessary.”*

The basic goal of biodiversity conservation is to maintain naturally occurring ecosystems, communities, and native species. For the proposed action evaluated in this EA, impacts to the biodiversity of the ROI would be significant if the mitigative measures outlined are not implemented. The area has been previously disturbed and the ecosystem altered for several decades and measures should be taken to restore and protect the biodiversity of the area.

Suggestions to minimize any anticipated impacts for planned or previous construction in the ROI, and subsequently increase biodiversity in this area, include:

- Incorporate measures to minimize landscape fragmentation.
- Link blocks of originally connected habitat through landscape corridors.
- Utilize only native species in landscape plantings.
- Monitor for biodiversity impacts and for changes in biodiversity.
- Restrict training to already disturbed areas (fields checked for cultural resources) to minimize impacts to biodiversity.

#### **4.20 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED.**

Adverse environmental effects that cannot be avoided include construction-related emissions of fugitive dust and exhaust products; temporary displacement of wildlife during construction due to noise and construction activities; some destruction of existing vegetation; and some sediment runoff into surrounding areas during construction activities. However, through implementation of the program actions and mitigation measures described within this document, these effects can be minimized.

**4.21 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.** The proposed action would use existing facilities and infrastructure on Redstone Arsenal and would not eliminate any options for future use of Redstone Arsenal. The proposed action would be undertaken in accordance with the Redstone Arsenal Master Plan EA (U.S. Army Missile Command 1994) that provides a management tool to aid in making operational support decisions by incorporating the concept of comprehensive planning.

**4.22 FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS.** The proposed action would not substantially affect human health or the environment and would not exclude persons from participation, deny persons the benefits, or subject persons to discrimination because of their race, color, or national origin.

**4.23 CONDITIONS NORMALLY REQUIRING AN ENVIRONMENTAL IMPACT STATEMENT.** The potential impacts arising from the continued OMMCS training activities were evaluated specifically in the context of the criteria for actions requiring an Environmental Impact Statement described in DOD Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions* (U.S. Department of Defense 1979), and AR 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army 1988).

Specifically, the proposed project activities were evaluated for their potential to:

- significantly affect environmental quality or public health and safety;
- significantly affect historic or archaeological resources, public parks and recreation areas, wildlife refuge or wilderness areas, wild and scenic rivers, or aquifers;
- adversely affect properties listed or meeting the criteria for listing on the National Register or the National Registry of Natural Landmarks;
- significantly affect prime and unique farmlands, wetlands, ecologically or culturally important areas, or other areas of unique or critical environmental concern;
- result in significant and uncertain environmental effects or unique or unknown environmental risks;
- significantly affect a species or habitat listed or proposed for listing on the Federal list of endangered or threatened species;
- establish a precedent for future actions;
- adversely interact with other actions resulting in cumulative environmental effects; and
- involve the use, transportation, storage, and disposal of hazardous or toxic materials that may have significant environmental impact.

The evaluation indicated that the proposed action for continued OMMCS training operations and construction activities did not meet any of these criteria.

## CHAPTER 5.0

### CONCLUSION

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The impact to the environment from the proposed actions at the U.S Army Ordnance Missile and Munitions Center and School has been assessed. The overall impact of the proposed action is not significant and mitigable. A comparison of the environmental consequences of each alternative is located in Section 2.3.

The proposed action would result in the Army being able to plan for the future development and modernization of OMMCS facilities. Training operations using existing OMMCS buildings and ranges would continue. Continuing mission activities at Redstone Arsenal avoids the additional environmental, safety, and cost concerns associated with performing the OMMCS mission elsewhere for execution of the same effort. The OMMCS would also be able to provide better training in combat service support for munitions, missile maintenance, air defense gun weapon systems, and electronics maintenance, testing, measurement, and diagnostic equipment. The addition of one building and the installation of an underground training bunker/tornado shelter located on McKinley Range and the addition of a sanitary sewer system at the ASP Range would be positive improvements to the OMMCS training support.

The No-Action Alternative would require that the Army not plan for the future development and modernization of OMMCS facilities. OMMCS operations would continue without the benefits afforded by comprehensive planning and the proposed action. Existing training activities at the OMMCS facilities would continue as scheduled. Under the No-Action Alternative, OMMCS training areas would be subjected to potential impacts to biological resources (possible loss of suitable and varied flora and fauna habitat), cultural resources (inadvertent destruction of previously unknown resources), and noise (excessive noise impacting the surrounding areas) if field training exercises were conducted without regard to environmental consequences.

Impacts to the environment from the proposed action, and the reasons that these impacts are found to be not significant, are listed below for each resource.

***Air Quality*** - Construction-related emissions of fugitive dust and exhaust products would depend on the amount of construction and earthwork performed and the construction mobilization schedule. Fugitive dust from ground-disturbing activities can be reduced up to 50 percent by regular site-watering practices.

***Biological Resources*** - The continuation of training activities conducted in an environmentally conscientious manner is a critical mitigation measure to avoid impacting sensitive biological resources that are either on or adjoin the approximately 3,000 acres of training and range areas assigned for OMMCS mission activities. Properly applied OMMCS management directives and guidelines, compliance with applicable laws and regulations, and environmental management oversight from the Directorate of Environmental Management and Planning are necessary to ensure that training activities conducted over this vast expanse of Redstone Arsenal lands do not impact the rich biological resources of this immediate area or surrounding areas.

The site of the proposed new building at McKinley Range is an existing motor park. Short term impacts to the vegetation resources (primarily sod) are expected to be not significant and can be mitigated by best management practices (e.g., siltation barriers, hay bales) during construction activities. Short term impacts to wildlife resources in the area of the proposed new building at

McKinley Range are expected to be not significant during building construction. Wildlife that use the area may be temporarily displaced during construction due to noise and construction activities. Once construction is completed, wildlife would be expected to move back into the area. There are no aquatic resources at the site of the proposed new building. However, the new building will be south of a tupelo swamp the soldiers have dubbed “snake pit,” which is environmentally sensitive to sedimentation. Measures should be taken during construction to protect this tupelo swamp from construction erosion. Short term impacts from potential runoff during construction activities would be experienced but are not expected to be significant. These impacts can be mitigated through the use of best management practices (e.g., siltation barriers, hay bales) by the selected construction contractors. Drip pans are also placed under vehicles stored in the motor park as a precautionary measure and to avoid any soil and groundwater contamination from leaking vehicles.

The site of the underground training bunker/tornado shelter is in an area previously disturbed by earth moving activities. The site is small and no significant impacts to the natural resources of the site are expected. No mitigation measures are deemed necessary for the installation of this structure.

No significant impacts would be expected to vegetation resources of the ASP Range due to the proposed new sanitary sewer system. An area of sod would be removed during the sanitary sewer installation, but this would be replaced in a short time with no impacts expected for the remaining vegetation resources. No significant impacts would be expected to wildlife resources in the area of the proposed new sanitary sewer system during construction. Wildlife that utilize the area may be temporarily displaced during construction due to noise and construction activities. Once construction is completed, wildlife can be expected to move back into the area.

***Cultural Resources*** - The recommended mitigation for the proposed building construction on the McKinley Range is to site the new building no closer than 50 feet from Lynch Cemetery and to not construct a building on the east side of the cemetery due to the potential for graves being located outside the fenced borders of the cemetery. The new building would be sited southeast of the existing Building 8001 in an area currently occupied by a motor park. Also, no earth moving activities should be conducted west of the motor park because of the archaeological material discovered there.

In addition, if during construction activities or any OMMCS training activities, personnel observe items that may have historical or archaeological value, such observations will be reported immediately to the Redstone Arsenal Environmental Office so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. Construction operations or training activities in that area shall cease in order to prevent destruction or disturbance of these items, and the area shall be restricted to prevent further disturbance or removal of items by unauthorized personnel.

***Hazardous Materials and Waste*** - There are no impacts expected to hazardous materials and waste from the proposed action.

***Health and Safety*** - Mitigation measures for normal operations at the OMMCS facilities and ranges that are in effect now and should be maintained include:

- storage of hazardous materials with flashpoints less than 141° F inside flammable safety cabinets,

- training of all personnel per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200),
- the participation of personnel involved in calibration and repair of meters involving radioactive sources in a three week Radiation Protection course,
- minimizing the inhalation potential from explosive materials by conducting all demolition activities outdoors,
- instructing personnel to avoid touching sensitive areas of the body when working with explosives and to wash their hands after working with explosives (especially before consuming food),
- using lead vests when working around X-ray machines,
- continuing to have the Arsenal Fire Department stand by during demolition activities conducted during dry weather, and
- having MSDSs and chemical inventories available at all locations.

Impacts to health and safety due to construction at McKinley Range and the installation of the sanitary sewer system at the ASP Range would be minimized by using established safety procedures such as AR 385-10, *Safety*, and all appropriate OSHA regulations including 29 CFR Part 1926, *Safety and Health Regulations for Construction*. The selected building contractor would obtain a NPDES construction permit from the ADEM. The selected building contractor would comply with the NPDES permit requirements as well as all applicable Federal, state, and local laws and regulations during construction.

***Infrastructure and Transportation*** - There are no impacts expected to infrastructure and transportation from the proposed action.

***Land Use*** - There are no impacts expected to land use from the proposed action.

***Noise*** - Trained personnel (instructors and students) would follow in-place regulations for hearing protection and noise attenuation. Hearing protection that is currently used (i.e., foam rubber earplugs and ear muffs) would continue to be used. The Corkern Range would continue to use its bunker for additional protection for personnel when training includes the detonation of 105mm shells. Ear muffs would continue to be used within Building 2575 at the ASP Range since this building has a paint booth within it that generates noise during painting operations. The HDD Range expects to eventually replace the existing bunker (now unavailable for use due to peeling lead-based paint on the bunker's ceiling) with a concrete bunker so that it can be used for additional protection. At no time would training operations personnel conduct simultaneous exercises that result in significant noise impacts. Training operations are conducted in controlled areas with no significant increase expected over current operations. Entry to the training areas is limited to only essential personnel (instructors and students). The Arsenal would take measures to reduce noise such as monitoring weather to avoid the use of ranges when conditions (i.e., temperature, humidity, wind, and cloud cover) are not favorable. Unacceptable Arsenal noise production would be stopped until conditions are proper to avoid any complaints. Projected impacts from construction activities would be mitigated by confining noise producing activities to restricted hours.

***Geology and Soils*** - During construction activities, siltation barriers would be used to minimize the amount of sediment runoff to the surrounding areas.

***Socioeconomics*** - There are no impacts expected to socioeconomics from the proposed action.

**Water Resources** - During construction activities, siltation barriers would be used to minimize the amount of sediment runoff to the surrounding areas.

Installation of a sanitary sewer system on the ASP Range would result in a positive impact since a sanitary sewer system would protect local groundwater resources from degradation.

A summary table giving a comparison of the environmental consequences of the alternatives by individual resource is presented in Table 5-1 below.

**Table 5-1: Comparison of Environmental Consequences Associated with the Environmental Assessment of the Ordnance Missile Munitions Center and School**

RESOURCE	PROPOSED ACTION	NO-ACTION ALTERNATIVE
Air Quality	x	--
Biological Resources	x	--
Cultural Resources	x	--
Hazardous Materials and Waste	--	--
Health and Safety	x	--
Infrastructure and Transportation	x	--
Land Use	--	--
Noise	x	x
Geology and Soils	x	--
Socioeconomics	--	--
Water Resources	x	--

-- = No Impact    x = No Significant Impact    o = Significant Impact

## **CHAPTER 6.0**

### **LIST OF PREPARERS**

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Larry W. Blackwell  
Director, Environmental Programs  
M.A., Human Relations, Louisiana Technical University, 1988  
BFA, Advertising, Louisiana Technical University, 1971

Lisa Darsey  
Certified Industrial Hygienist  
M.P.H., Occupational Health and Safety, University of Alabama at Birmingham, 1990

Jeff Day  
Hydrogeologist  
B.S., Geology, University of South Alabama, 1992

Kathy Guelde  
Environmental Engineer  
B.S., Environmental Engineering, University of Findlay, 1995

Don Hagedorn  
Senior Regulatory Specialist  
B.A., Economics, Loyola Marymount University, 1989

Jeffery H. Scott, Ph.D.  
Senior Fish and Wildlife Biologist  
Ph.D., Aquatic Ecology/Limnology, Auburn University, 1990  
M.S., Biology, Jacksonville State University, 1982  
B.S., Biology, Jacksonville State University, 1977

Joseph B. Venable, P.E.  
Program Manager  
M.E., Civil Engineering, University of Florida, 1976  
B.S., Civil Engineering, University of Kentucky, 1968

Jim Richards  
Senior Historian  
B.S., History, University of North Alabama, 1975

## **CHAPTER 7.0**

### **INDIVIDUALS/AGENCIES CONSULTED**

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#### **7.1 Agencies/Organizations/Individuals Sent Copies of the Assessment**

As part of the CEQ Regulations on the National Environmental Policy Act, the U.S. Army Missile Command is circulating the Final Environmental Assessment of the Ordnance Missile Munitions Center and School to the following agencies, organizations, and individuals.

Alabama State Historic Preservation Office, Montgomery, Alabama

U.S. Army Aviation and Missile Command, Environmental Management and Planning Directorate, Natural Resources Team (AMSMI-RA-EMP-IR-NR), Redstone Arsenal, Alabama

U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

#### **7.2 Individuals and Agencies Contributing to the Project**

CPT John Anness, Corkern Range/ASP/CSA, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

CWO4 Steve M. Caudill, Safety and Environmental Office (ATSK-CMT-S), U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

Don Cranford, Safety and Environmental Office (ATSK-CMT-S), U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

Joseph O. Collins, Corkern Range, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

SFC Kenneth Dawkins, Ammunition Supply Point, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

Daniel J. Dunn, Environmental Protection Specialist, U.S. Army Aviation and Missile Command Environmental Office, Redstone Arsenal, Alabama

Raymond D. Funderburg, Hazardous Devices Division Range, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

SFC Jerry Harkleroad, McKinley Range, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

CPT Richard Ratliff, Corkern Range/ASP/CSA, U.S. Army Ordnance Missile Munitions Center and School, Redstone Arsenal, Alabama

MSG Bob Reed, McKinley Range, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

CPT Randy Tate, McKinley Range, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

Robert Tolgo, Corkern Range, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

SFC Timothy Udelhofen, McKinley Range, U.S. Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama

Carolene Wu, Environmental Protection Specialist, U.S. Army Aviation and Missile Command Environmental Office, Redstone Arsenal, Alabama

Susan Weber, Environmental Protection Specialist, U.S. Army Aviation and Missile Command Environmental Office, Redstone Arsenal, Alabama

## CHAPTER 8.0

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